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Paper 12
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TOYOTA MOTOR CORPORATION,
Petitioner,

v.

SIGNAL IP, INC.,
Patent Owner.

Case IPR2016-00293
Patent 5,714,927

Before JEREMY M. PLENZLER, PETER P. CHEN, and JASON J. CHUNG, *Administrative Patent Judges.*

CHUNG, *Administrative Patent Judge.*

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

I. INTRODUCTION

Petitioner, Toyota Motor Corporation, filed a Petition requesting an *inter partes* review of claims 1, 2, and 6 of U.S. Patent No. 5,714,927 (Ex. 1001, "the '927 patent"). Paper 2 ("Pet."). In response, Patent Owner, Signal IP, Inc., filed a Preliminary Response. Paper 8 ("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 . . . 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."

For the reasons set forth below, we deny institution of *inter partes* review of the '927 patent.

A. Related Matters

The parties indicate that the '927 patent also has been asserted in various proceedings. Pet. 1–2; Paper 3, 2–3. In addition, claims 1, 2, and 6 of the '927 patent were at issue in IPR2015-00968, which was denied institution. Pet. 2; Paper 3, 3.

B. The '927 Patent

The '927 patent relates to side detection vehicle radar systems that control an alarm or alert indicator to increase the perceived coverage of a vehicle's blind spot. Ex. 1001, 1:7–10. Figure 4 of the '927 patent is reproduced below.

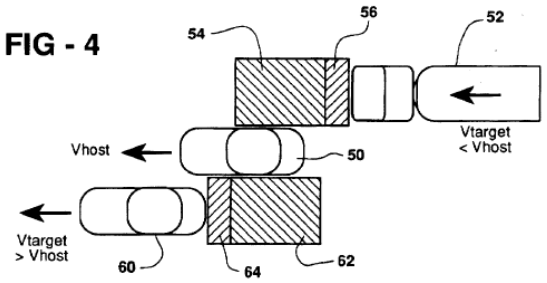

Figure 4 of the ’927 patent illustrates radar coverage zones.

As illustrated in Figure 4 of the ’927 patent, the radar system on the host vehicle 50 extends the perceived coverage of the vehicle’s blind spots 54, 62 by zone extensions 56, 64. *Id.* at 4:7–21. The system prevents or minimizes radar signal dropouts due to signal flickers in order to improve the zone of coverage in a vehicle side radar detection system and minimizes annoying alert activity when passing stationary or slow moving targets. *Id.* at 2:10–15. The time of alert signal activation is measured and compared to a threshold time. *Id.* at 2:16–17. When the alert time is greater than or equal to the threshold time, a variable sustain time is applied to hold the alert signal on, which bridges the dropout periods due to low radar signal reflectivity. *Id.* at 2:25–28.

C. Illustrative Claim

Claim 1 is the only independent claim challenged. Claims 2 and 6 depend from claim 1. Claim 1, reproduced below, is illustrative.

> 1. In a radar system wherein a host vehicle uses radar to detect a target vehicle in a blind spot of the host vehicle driver, a method of improving the perceived zone of coverage response of automotive radar comprising the steps of:
>
> determining the relative speed of the host and target vehicles;

> selecting a variable sustain time as a function of relative vehicle speed;
>
> detecting target vehicle presence and producing an alert command;
>
> activating an alert signal in response to the alert command;
>
> at the end of the alert command, determining whether the alert signal was active for a threshold time; and
>
> if the alert signal was active for the threshold time, sustaining the alert signal for the variable sustain time, wherein the zone of coverage appears to increase according to the variable sustain time.

Ex. 1001, 5:28–6:2.

D. Prior Art Relied Upon

Petitioner relies upon the following prior art references:

Agravante	US 5,767,793	Issued June 16, 1998	(Ex. 1005)
Tsou	US 5,508,706	Issued Apr. 16, 1996	(Ex. 1006)
Pakett[1]	US 5,325,096	Issued June 28, 1994	(Ex. 1002)
Kawai[2]	JP 04-348293	Published Dec. 3, 1992	(Ex. 1003)

E. Asserted Grounds of Unpatentability

Petitioner asserts the following grounds of unpatentability:

Challenged Claims	Basis	References
1, 2, and 6	§ 103(a)	Agravante and Tsou

[1] Pakett is misidentified on pages iii and 4 of the Petition, and page 5 of Dr. Nikolaos Papanikolopoulos' Declaration (Ex. 1010 ¶ 14) as US 5,517,196. The citations in the Petition correspond to US 5,325,096, which appears as Exhibit 1002.

[2] A translation of Kawai is provided. Ex. 1004. For purposes of this Decision, citations herein are to the translation.

Challenged Claims	Basis	References
1, 2, and 6	§ 103(a)	Pakett and Kawai

II. ANALYSIS

A. Claim Construction

In an *inter partes* review, we construe claim terms in an unexpired patent according to their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b); *see also In re Cuozzo Speed Techs., LLC*, 793 F.3d 1268, 1278–79 (Fed. Cir. 2015), *cert. granted sub nom. Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 890 (2016) (mem.). Consistent with the broadest reasonable construction, claim terms are presumed to have their ordinary and customary meaning as understood by a person of ordinary skill in the art in the context of the entire patent disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). Also, we must be careful not to read a particular embodiment appearing in the written description into the claim if the claim language is broader than the embodiment. *See In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993) ("limitations are not to be read into the claims from the specification"). However, an inventor may provide a meaning for a term that is different from its ordinary meaning by defining the term in the specification with reasonable clarity, deliberateness, and precision. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).[3]

[3] Petitioner acknowledges that "[the] application of either the broadest reasonable interpretation standard or the claim construction standard summarized in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005)

Petitioner identifies constructions for several claim terms based on (1) a related *inter partes* review (Pet. 8), and (2) a related matter before the U.S. District Court for the Central District of California (*id.* at 6–8). Regarding the related *inter partes* review, the Board previously construed the term "alert command" as raw alert data that is used to generate an alert signal, and the term "alert signal" as a signal that provides a visual or audio alert to a driver. *Volkswagen Grp. of Am., Inc. v. Signal IP, Inc.*, Case IPR2015-00968, slip op. at 6–7 (PTAB Aug. 25, 2015), Paper 6.

In order to reach our decision below, we need only construe the terms "alert command" and "alert signal." We, therefore, decline to specifically construe any other claim terms at this time.

We agree with Petitioner's construction of the terms "alert command" and "alert signal," consistent with our prior construction in IPR2015-00968. (*See id.* for our prior construction of the terms.) Thus, we construe the term "alert command" as raw alert data that is used to generate an alert signal, and the term "alert signal" as a signal that provides a visual or audio alert to a driver. *Id.* As explained below, even using Petitioner's construction of these terms, Petitioner's challenge fails to establish a reasonable likelihood that Petitioner would prevail in establishing unpatentability.

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would produce the same result." Pet. 6. Here, we apply the broadest reasonable interpretation standard because the '927 patent is still pending. 37 C.F.R. § 42.100(b).

B. Principles of Law

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int'l Co. v. Teleflex Inc*., 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

In that regard, an obviousness analysis "need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *KSR*, 550 U.S. at 418; *see also Translogic*, 504 F.3d at 1259, 1262. A prima facie case of obviousness is established when the prior art itself would appear to have suggested the claimed subject matter to a person of ordinary skill in the art. *In re Rinehart*, 531 F.2d 1048, 1051 (CCPA 1976).

C. Challenge of Claims 1, 2, and 6 Based on Agravante and Tsou

Petitioner asserts that claims 1, 2, and 6 are unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of Agravante and Tsou. Pet. 13. To support its contentions, Petitioner provides explanations as to how the prior art allegedly teaches or suggests each claim limitation. *Id.* at

13–35. Petitioner also relies upon a Declaration of Dr. Nikolaos Papanikolopoulos, who has been retained as a declarant by Petitioner for the instant proceeding. Ex. 1010.

1. Agravante (Ex. 1005)

Agravante, titled "Compact Vehicle Based Rear and Side Obstacle Detection System Including Multiple Antennae," describes a radar-based obstacle detection system for vehicles. Ex. 1005, Abstract, 5:38–49. When determining whether an obstacle exists in the vehicle's blind spot, Agravante considers whether an object "persists over enough thresholding intervals." *Id.* at 7:24–25. Agravante teaches that reliability of the detection system may be improved by using an "adaptive threshold" to determine if an obstacle is present, and notes that "[v]arious types of adaptive threshold techniques are discussed" in Tsou. *Id.* at 6:64–7:14.

2. Tsou (Ex. 1006)

Tsou, titled "Radar Signal Processor," describes a radar signal processor for detecting objects, which may be integrated onto a vehicle to assist with blind spot detection and crash avoidance. Ex. 1006, Abstract, 1:43–45. Tsou describes adaptive threshold device 464 used in the adaptive threshold techniques referenced in Agravante. *Id.* at 14:5–15:9. Tsou describes target decision device 500 that is connected to adaptive threshold device 464 and performs target acquisition and tracking based on data from the adaptive threshold device. *Id.* at 15:3–20. Target decision device 500 operates in two modes: acquisition mode and tracking mode. *Id.* at 15:7–9.

In the acquisition mode, target decision device 500 determines whether a valid target exists. *Id.* at 15:13–32. Once a valid target is identified, target decision device 500 switches to tracking mode. *Id.* at 15:30–32.

In the tracking mode, target decision device 500 initializes a tracking counter. *Id.* at 17:44–18:8. During tracking mode, "the tracking counter is incremented at each tracking time interval if the tracking signal exceeds the tracking threshold signal," i.e., if a valid target is still present, and "[t]he tracking counter is decremented at each tracking time interval if the tracking signal is below the tracking threshold," i.e., the target is lost. *Id.* at 17:13–34, 63–67. Tsou further describes that "[i]f the tracking counter falls to zero, then the target is presumed to be lost and the target decision device 500 . . . returns to the acquisition mode." *Id.* at 18:1–5. Using the target counter provides hysteresis in the tracking mode and prevents target decision device 500 from prematurely returning to the acquisition mode if the target is only momentarily lost. *Id.* at 18:5–8.

3. Analysis of Claim 1

Claim 1 recites, in part, "at the end of the alert command, determining whether the alert signal was active for a threshold time." Ex. 1001, 5:41–42. Petitioner acknowledges that Agravante does not disclose these limitations, and instead relies on Tsou as allegedly teaching or suggesting these limitations. Pet. 23. We are not persuaded that Tsou teaches or suggests these limitations.

We denote the portion of claim 1 at issue as three limitations: (1) at the end of the alert command ("first limitation"), (2) determining whether

the alert signal was active ("second limitation") (3) for a threshold time ("third limitation"). Ex. 1001, 5:41–42. Regarding the first limitation, Petitioner asserts that the determination that a valid target exists in Tsou corresponds to the "alert command" as recited in claim 1. Pet. 23 (citing Ex. 1010 ¶¶ 58, 61). Based on Petitioner's assertion, it follows logically that the scenario when a valid target is no longer detected in Tsou corresponds to the claim 1 limitation "the end of the alert command." Pet. 23.

As for the second limitation, Petitioner asserts that "whenever Tsou's system is in tracking mode and tracking a previously detected object, it will issue signals resulting in provision of an alert to the driver (*i.e.*, the claimed 'alert signal')." *Id.* (citing Ex. 1010 ¶ 60). Petitioner further asserts that at Tsou's tracking time intervals, the claim 1 limitation "determining whether the alert signal was active" occurs. *Id.* at 24 (citing Ex. 1010 ¶¶ 61–62).

Regarding the third limitation, Petitioner maps the first tracking interval of Tsou immediately after entering tracking mode to the claimed threshold time. *Id.* at 24 (citing Ex. 1010 ¶¶ 61–62).

Based on the above, Petitioner concludes that:

> [B]ecause Tsou does not begin to increment its tracking counter (which results in the sustaining of an alert until the counter reaches zero) unless at least one tracking time interval has passed, it "determin[es] whether the alert signal was active for a threshold time."

Id. at 24 (second alteration in original); *see also* Ex. 1010, ¶¶ 61–62.

We disagree with Petitioner that Tsou teaches determining whether the alert signal was active for a threshold time. Tsou teaches that at each tracking time interval, the tracking counter is incremented or decremented

based on the presence or absence of an *alert command* and is monitored to determine whether the tracking counter is above zero, or has fallen to zero. Ex. 1006, 17:63–18:8. If the tracking counter is at zero, the target decision device returns to the acquisition mode, and the alert signal ends. *Id.* at 18:3–5; Pet. 24. However, Petitioner acknowledges that during the tracking time interval, the *alert signal* is active because the system is in the tracking mode. Pet. 23. That is, regardless whether the *alert command* ended during the first tracking time interval of Tsou immediately after entering tracking mode, the *alert signal* will remain active until the end of the first tracking time interval. Pet. 23.

Thus, Petitioner has failed to establish that in Tsou a determination is made whether the alert signal was active. Rather, the cited portions of Tsou address a scenario where the alert signal will have been active during the entire tracking time interval. Pet. 23; Ex. 1006, 17:54–18:8. Petitioner has not identified any scenarios where the alert signal would not have been active for the duration of the first tracking time interval, because, as Petitioner acknowledges, when the system of Tsou is in the tracking mode, the alert signal is active (Pet. 23), and the system of Tsou is in the tracking mode at least for the duration of the first tracking time interval. Ex. 1006, 17:54–18:8.

Instead, the only determination taught in Tsou is a determination whether the tracking counter is above zero or has fallen to zero. *Id.* at 18:1–5. Dr. Papanikolopoulos explains:

> Thus, if an object is detected once, but not detected again after tracking mode is entered, the tracking counter will never be

> incremented, and the system will immediately reenter acquisition mode, and the alert signal will be deactivated. In other words, the alert signal will not be sustained. If, on the other hand, the target is tracked (and the alert signal is active) for at least one tracking interval, then the alert signal will be sustained according to the incremented tracking counter, as required by claim 1.

Ex. 1010 ¶ 62.

However, what Dr. Papanikolopoulos describes is Tsou determining whether the *alert command* was active at the end of the first tracking time interval, not whether the *alert signal* was active for the threshold time, because the decision whether to sustain the *alert signal* is based on whether the *alert command* is active at the end of the first tracking time interval. Dr. Papanikolopoulos and Petitioner fail to explain how determining whether the *alert command* is active at the end of the first tracking time interval teaches "determining whether the *alert signal* was active for a threshold time" (emphasis added), as recited in claim 1.

Although Tsou's determination of the status of the tracking counter may be related to the alert signal because the alert signal is active while the tracking counter remains above zero (Pet. 23–24), Tsou's determination whether the tracking counter is at or above zero is not the same as "determining whether the alert signal was active for a threshold time." Thus, we are not persuaded that Tsou teaches or suggests "at the end of the alert command, *determining whether the alert signal was active for a threshold time*," as recited in claim 1 (emphasis added).

Further, even if we accepted Petitioner's interpretation of Tsou as teaching the claimed "determining whether the alert signal was active for a

threshold time," which we do not, we are not persuaded that the cited portions of Tsou teach or suggest the subsequent limitation in claim 1, "if the alert signal was active for the threshold time, sustaining the alert signal for the variable sustain time."[4]

Specifically, at the end of the first tracking time interval, the alert signal would have been active during the entire first tracking time interval even if the alert command is no longer active. Therefore, the determination will be an affirmative (that the alert signal was active for the threshold time), and, according to the claim, the alert signal *should be sustained* for the variable sustain time. But, as Dr. Papanikolopoulos acknowledges, "if an object is detected once, but not detected again after tracking mode is entered . . . the alert signal will not be sustained." Ex. 1010 ¶ 62. Stated differently, Dr. Papanikolopoulos acknowledges if the alert command is inactive after the first tracking time interval (i.e., the claimed "threshold time" as mapped by Dr. Papanikolopoulos) because an object is no longer detected, the alert signal of Tsou *will not be sustained*, which fails to teach or suggest "if the alert signal was active for the threshold time, *sustaining the alert signal for the variable sustain time*" (emphasis added) as recited in claim 1. *Id.*

In summary, even if we accepted Petitioner's interpretation of Tsou as teaching the claimed "determining whether the alert signal was active for a threshold time," which we do not, the cited portions of Tsou still fail to teach or suggest the claimed sustaining the alert signal for the variable sustain time

[4] Petitioner acknowledges that Agravante also does not teach these limitations, and instead relies on Tsou as allegedly teaching these limitations. Pet. 23.

if the alert signal was active for the threshold time. Accordingly, we are not persuaded that the information presented in the Petition establishes a reasonable likelihood that Petitioner would prevail in establishing unpatentability of claims 1, 2, and 6 as obvious over Agravante and Tsou.

D. Challenge of Claims 1, 2, and 6 Based on Pakett and Kawai

Petitioner asserts that claims 1, 2, and 6 are unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of Pakett and Kawai. Pet. 35. To support its contentions, Petitioner provides explanations as to how the prior art allegedly meets each claim limitation. *Id.* at 35–60. Petitioner also relies upon the Declaration of Dr. Papanikolopoulos. Ex. 1010.

1. Pakett (Ex. 1002)

Pakett, titled "Smart Blind Spot Sensor," describes sensing the presence of obstacles in a vehicle's blind spots and generating an indicator signal notifying the vehicle operator of the presence of the obstacle. Ex. 1002, Abstract. The indicator may be an illuminated indicator or an audible indicator. *Id.* Rather than immediately providing an alarm or warning when an obstacle is detected, the system of Pakett waits until the end of a persistence period. *Id.* at 6:46–51, 7:53–63. Pakett describes the "persistence period" as the amount of time it takes the vehicle with the mounted radar system to travel 15 feet. *Id.* at 6:43–46. During the persistence period, no warnings are sent to the driver indicators. *Id.* at 6:46–51. After the persistence period, a warning is sent to the driver indicators if an obstacle is detected within one second after the end of the persistence

period, or two seconds after a prior warning was sent. *Id.* at 6:51–55. Pakett also describes "determin[ing] how long it has been since the warning was last activated" when a warning is presently being displayed. *Id.* at 7:64–8:10. If the warning has been displayed for more than one second without being reactivated, the system of Pakett ends the warning display. *Id.*

2. Kawai (Exs. 1003 and 1004)

Kawai, titled "Onboard Radar Device," describes a signal processing filter for smoothing a radar signal subject to noise on an onboard radar device. Ex. 1004 ¶¶ 1, 8. Kawai describes a problem of detection loss in a radar detection signal, illustrated in Figure 2, reproduced below.

[FIG. 2]

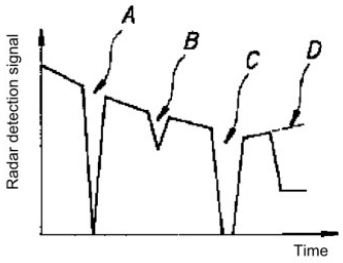

Figure 2 of Kawai illustrates a radar detection signal with signal dropout.

Labels A, B, C, and D in Figure 2 of Kawai represent detection loss and misdetection periods. Ex. 1004 ¶ 6. In order to handle detection loss periods, Kawai describes means for "continuously hold[ing] the value of the detection signal from immediately before, limited to a prescribed time span, when the radar detection signal changes in excess of a preset threshold value." *Id.* ¶ 20. The "prescribed time span" may be set variably based on

the amount of change in the radar detection signal. *Id.* ¶ 25. Figure 4 of Kawai, reproduced below, illustrates the result of holding the value of the detection signal when the radar detection signal changes excessively.

[FIG. 4]

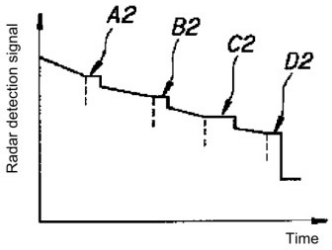

Figure 4 of Kawai illustrates the radar detection signal with smoothed portions over the dropout periods.

Kawai describes that by holding the value of the detection signal, almost none of the effect of the detection loss periods remains. *Id.* ¶ 22. Kawai further describes that additional filtering may be carried out to further smooth out the portions A2, B2, C2, and D2 illustrated in Figure 4 above. *Id.* ¶ 24.

3. Analysis of Claim 1 – "Determining Whether the Alert Signal was Active for a Threshold Time"

Claim 1 recites, in part, "at the end of the alert command, determining whether the alert signal was active for a threshold time." Ex. 1001, 5:41–42. Petitioner asserts that "[t]here are only a few, insubstantial differences between [the teachings of Pakett] and [this] limitation of claim 1." Pet. 46–47. Petitioner first identifies as a difference that by waiting for a variable persistence period before activating a warning, Pakett's system determines whether an *alert command* has been active for a threshold time before it

activates the warning and applies a warning sustain time, rather than "determining whether the *alert signal* was active for a threshold time." *Id.* at 47 (emphasis added). Petitioner asserts that the combination of Pakett and Kawai and the knowledge and skill of one of ordinary skill in the art overcomes these deficiencies of Pakett. *Id.* at 46. We disagree with Petitioner and are not persuaded that the combination of Pakett and Kawai, with the knowledge and skill of one of ordinary skill in the art, overcomes the first "insubstantial" difference identified by Petitioner.

Petitioner asserts that it would have been obvious "to modify Pakett's system such that it determines whether the 'alert signal,' as opposed to the 'alert command,' was active for a 'threshold time' as the claim requires." Pet. 47. Petitioner asserts that this could be accomplished by activating a warning (alert signal) as soon as Pakett recognizes that an obstacle is present, and then applying the processing method previously applied to the persistence period instead to determine whether to sustain the warning. *Id.* at 47–48 (citing Ex. 1010 ¶¶ 101–04). Petitioner asserts that "one of ordinary skill in the art would consider Pakett's delay of a warning until after the end of the persistence period to be nothing more than an optional redundancy," and, thus, that this modification would have been obvious as "nothing more than a routine, obvious design choice." *Id.* at 48 (citing Ex. 1010 ¶ 104). We disagree with Petitioner that the cited portions of Pakett's teaching to delay the warning until after the persistence period is "nothing more than an optional redundancy," at least because the cited portions of Packett do not indicate, either explicitly or implicitly, the

function of waiting for the persistence period before sending a warning to the driver indicators as optional or redundant. *See id.*

Pakett clearly states that during the persistence period, "*no* warnings are sent to the driver indicators." Ex. 1002, 6:50–51 (emphasis added). Pakett explains that waiting through the persistence period before sending warnings to the driver indicators prevents the system from incorrectly identifying stationary obstacles that were identified by the square wave generator 29 as valid obstacles in the blind spot. *Id.* at 7:56–63. Pakett thus explains that waiting through the persistence period before sending warnings to the driver indicators filters out false positives of objects in the blind spot of the vehicle. *Id.*

Although Petitioner alleges that Pakett teaches "numerous other methods to filter out and ignore stationary objects" (Pet. 48), only one is taught in Pakett to "eliminate signals which represent . . . *stationary* objects." Ex. 1002, 5:19–21 (emphasis added). The other alleged "redundant" detection methods cited by Petitioner are related to limiting a detection distance so that only obstacles within a specified *range* are identified. Pet. 48 (citing Ex. 1002, 3:64–4:5, 4:16–26, 5:40–44). Limiting a detection distance of the system is not the same as eliminating signals which represent stationary objects.

The cited portion of Pakett teaches a low pass filter 27 that processes detection signals, and passes the processed signals to the square wave generator 29. Ex. 1002, 5:11–39. This low pass filter 27 is the other alleged "redundant" element that filters out and ignores stationary objects. Pet. 48. The signal from the square wave generator 29 is then output to a memory

register 37, which is used to establish the persistence period. Ex. 1002, 6:40–43. Pakett teaches that the persistence period is used to facilitate ignoring transitions at the output of the square wave generator caused by stationary objects. *Id.* at 7:58–63. It stands to reason that the low pass filter 27 does not filter out all signals stemming from stationary objects. If it did, there would be no need for the persistence period because no detection signals relating to stationary objects would make it through the low pass filter 27. Pakett explicitly states that the persistence period is used to eliminate identification signals that identify stationary objects, where the signals *made it through the filter* to the square wave generator 29. *Id.*

Thus, we disagree with Petitioner that the persistence period of Pakett is merely optional or redundant, because no other features taught in the cited portions of Pakett achieve the same result of "effectively ignor[ing] transitions at the output of the square wave generator 29 caused by . . . stationary obstacles." *Id.*

The second "insubstantial" difference identified by Petitioner is that Pakett's system employs a fixed 1-second sustain time, as opposed to the claimed "variable" sustain time. Pet. 49. Regarding this second difference, as discussed *infra* in Section II.D.4., Petitioner fails to establish that it would have been obvious to modify Pakett to arrive at the claimed "variable sustain time."

Accordingly, we are not persuaded that the information presented in the Petition establishes a reasonable likelihood that Petitioner would prevail in establishing unpatentability of claims 1, 2, and 6 as obvious over Pakett and Kawai.

4. Analysis of Claim 1 – "Selecting a Variable Sustain Time"

Claim 1 recites, in part, "selecting a variable sustain time as a function of relative vehicle speed." Ex. 1001, 5:34–35. Petitioner acknowledges that "Pakett . . . uses a *fixed* sustain time of one second." Pet. 43 (emphasis added). Petitioner cites to Kawai to overcome this deficiency of Pakett. *Id.* at 43–45. Petitioner asserts, referring to Kawai as an example, that "[i]t was known in the prior art, however, that a 'variable' sustain time could be employed to deal with misdetection, signal loss, and noise issues associated with a radar-based exterior object detection system." *Id.* at 43. We are not persuaded that the combination of Pakett and Kawai would have rendered obvious these limitations.

The fixed sustain time of Pakett cited by Petitioner refers to a minimum period of time that the alert signal of Pakett is sustained. Pet. 43 (citing Ex. 1002, 7:64–8:10). In contrast, the variable sustain time of Kawai cited by Petitioner refers to a period of time when a radar detection signal is *held* at a previously detected level to smooth over a possible temporary detection loss or misdetection. *Id.* at 43–44 (citing Ex. 1004 ¶¶ 20–25). The radar detection signal of Kawai is not "a signal that provides a visual or audio alert to a driver," and thus does not correspond to the claim 1 limitation "alert signal." Ex. 1004 ¶¶ 20–25. In fact, Kawai does not appear to teach any features that correspond to the claimed alert signal, and Petitioner does not identify any such features. Instead, the radar detection signal of Kawai appears more akin to "raw alert data that is used to generate an alert signal," and thus corresponds more closely to the claim 1 limitation "alert command." *Id.* ¶ 11; *see also* Section II.A., *supra*.

Petitioner asserts that "[o]ne of ordinary skill in the art would also consider the use of a 'variable sustain time' like that set forth Kawai to be nothing more than a routine, obvious design choice." Pet. 53. However, we are not convinced that the combination would have rendered obvious the features of claim 1, specifically "selecting a variable sustain time as a function of relative vehicle speed," even if the alleged "variable sustain time" of Kawai were applied to Pakett.

As discussed above, the sustain time referenced by Petitioner in Pakett relates to sustaining the alert signal of Pakett for a *fixed* time, whereas the sustain time referenced by Petitioner in Kawai relates to maintaining integrity of an alert command. Although combining the teachings of Kawai to sustain variably a radar detection signal with the teachings of Pakett to provide a fixed sustain of an alert signal may improve the smoothness and reliability of signals received by the antenna of Pakett (*compare* Ex. 1002, 3:43–63, *with* Ex. 1004 ¶ 11), the combination would not change Pakett's sustaining of the alert signal *for a fixed one second period* because Kawai is concerned with improving the underlying radar detection signals. Ex. 1002, 8:2–5; Ex. 1004 ¶ 20. That is, improving the underlying processed radar data of Pakett using Kawai's techniques may improve the reliability of the decision to activate the alert signal of Pakett, but would have no effect on the actual alert signal sustain time after the alert signal was last activated.

Accordingly, even if we accepted Petitioner's interpretation of Pakett and Kawai as teaching the claimed "determining whether the alert signal was active for a threshold time," which we do not as explained *supra* in Part II.D.3, Petitioner has not shown why one of ordinary skill in the art would

have considered the teachings of Kawai relating to improving underlying alert command data to be pertinent to the teachings of Pakett relating to sustaining an alert signal so as to arrive at the limitations of claim 1.

III. CONCLUSION

For the foregoing reasons, we are not persuaded the information presented in the Petition establishes a reasonable likelihood that Petitioner would prevail in establishing unpatentability of claims 1, 2, and 6 as obvious over either (1) Agravante and Tsou, or (2) Pakett and Kawai.

IV. ORDER

For the foregoing reasons, it is:

ORDERED that the Petition is *denied* as to all challenged claims and no trial is instituted.

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