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EXAMINER

HAN, CHARLES J

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte JACOB M. POVIRK, BRIAN J. ANDONIAN,
JOSEPH J. TORRES, and KENNETH G. WALEGA

Appeal 2014-007803
Application 12/571,590¹
Technology Center 3600

Before JENNIFER D. BAHR, AMANDA F. WIEKER, and
FREDERICK C. LANEY, *Administrative Patent Judges*.

LANEY, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Jacob M. Povirk et al. (Appellants) appeal under 35 U.S.C. § 134(a) from the Examiner's final decision rejecting claims 1–4, 6–10, and 16–18.² We have jurisdiction over this appeal under 35 U.S.C. § 6(b).

SUMMARY OF DECISION

We REVERSE and enter NEW GROUNDS OF REJECTION.

¹ According to Appellants, the real party in interest is Ford Global Technologies LLC. Appeal Br. 1 (filed March 3, 2014).

² Claims 5 and 11–15 have been canceled. *Id.* at 19, 20 (Claims App.).

INVENTION

Appellants' invention "relates generally to a differential mechanism, which transmits rotating power to the wheels of a motor vehicle." Spec. 1:7–8.

Claims 1 and 7 are independent claims. Claim 1, reproduced below, is illustrative of the claimed subject matter:

1. A method for controlling a locking differential of a motor vehicle, comprising the steps of:

(a) locking the differential, *provided* vehicle speed is less than a reference speed, yaw acceleration of the vehicle is greater than a reference yaw acceleration, *and* a wheel speed differential is greater than a reference wheel speed differential;

and

(b) unlocking the differential and preventing its engagement, *provided* vehicle speed is not less than the reference speed, *or* yaw acceleration of the vehicle is not greater than the reference yaw acceleration *or* the wheel speed differential is not greater than the reference wheel speed differential.

Appeal Br. 18 (Claims App.) (emphasis added).

REJECTIONS³

The following rejections are before us for review:

I. The Examiner rejected claims 2, 3, 8, and 9 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.

³ The Examiner withdrew the rejection of claims 1, 4, 6, 7, 10, and 16–18 under 35 U.S.C. § 112, first paragraph. Ans. 12. Additionally, the Examiner withdrew the rejection of claims 3 and 9 under 35 U.S.C. § 103(a). *Id.*

- II. The Examiner rejected claims 1 and 7 under 35 U.S.C. § 103(a) as being unpatentable over Marathe (US 2008/0255735 A1, pub. Oct. 16, 2008) and Piyabongkarn (US 2007/0184929 A1, pub. Aug. 9, 2007).
- III. The Examiner rejected claims 2 and 8 under 35 U.S.C. § 103(a) as being unpatentable over Marathe, Piyabongkarn, Newberry (US 2007/0250236 A1, pub. Oct. 25, 2007), and Carlen (EP 1,886,864 A1, pub. Feb. 13, 2008).
- IV. The Examiner rejected claims 4 and 16 under 35 U.S.C. § 103(a) as being unpatentable over Marathe, Piyabongkarn, Newberry, and Zalewski (US 5,695,022, iss. Dec. 9, 1997).
- V. The Examiner rejected claims 6 and 10 under 35 U.S.C. § 103(a) as being unpatentable over Marathe, Piyabongkarn, and Fischle (US 5,597,215, iss. Jan. 28, 1997).
- VI. The Examiner rejected claim 17 under 35 U.S.C. § 103(a) as being unpatentable over Marathe, Piyabongkarn, Newberry, Carlen, Rodeghiero (US 2006/0175113 A1, pub. Aug. 10, 2006), and Yoneda (US 2004/0059494 A1, pub. Mar. 25, 2004).
- VII. The Examiner rejected claim 18 under 35 U.S.C. § 103(a) as being unpatentable over Marathe, Piyabongkarn, Newberry, Zalewski, and Rodeghiero.

ANALYSIS

Rejection I and New Ground of Rejection

Claims 2 and 8

Claims 2 and 8 depend from claims 1 and 7, respectively. Appeal Br. (Claims App.) 18, 19. Step (b) of claims 1 and 7 both recite:

(b) unlocking the differential and preventing its engagement, *provided* vehicle speed is not less than the reference speed, *or* yaw acceleration of the vehicle is not greater than the reference yaw acceleration *or* the wheel speed differential is not greater than the reference wheel speed differential.

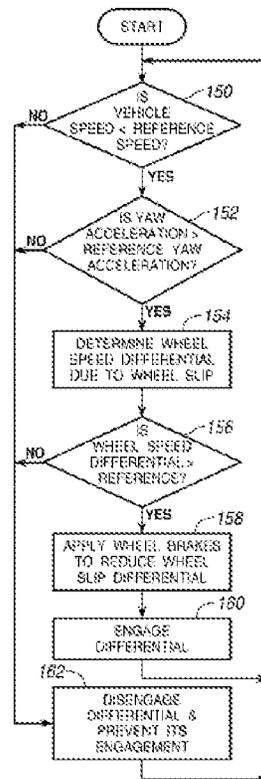
Id. (emphasis added). Claims 2 and 8 further recite:

wherein step (b) *further comprises determining* that an angular displacement of a steering wheel from a centered position is *less than* a reference angle, and that lateral acceleration of the vehicle is *less than* a reference lateral acceleration.

Id. (emphasis added). The Examiner finds the Specification fails to disclose the subject matter of claims 2 and 8. Final Act. 8, 10. In response, Appellants assert, “[t]he flow chart of figure 6 shows this in steps, which are described in the specification, p. 8, line 19 to p. 9, line 4.” Appeal Br. 6–7. Unconvinced, the Examiner counters, “[t]he Specification at pg. 8, line 19 to pg. 9, line 4, does discuss angular displacement and lateral acceleration, however, it describes the opposite of what Applicant is claiming” and Figure 6 “does not discuss either angular displacement or lateral acceleration.” Ans. 13–14. In particular, the Examiner appears to understand the Specification as describing unlocking the differential if the angular displacement of a steering wheel is *greater than* a reference angle and the vehicle’s lateral acceleration is *greater than* a reference lateral acceleration.

Id.

We disagree with the Examiner’s interpretation of the Specification for the following reasons. The Specification states, “Step 162 may also include determining that (i) the steering wheel is displaced from a centered position greater than a reference displacement angle, and (ii) the lateral acceleration of the vehicle 100 is greater than a reference lateral vehicle acceleration.” Spec. 8 (as filed Oct. 1, 2009).⁴ Step 152 refers to a decision box in Figure 6, reproduced below.



The above Figure 6 “is [a] logic flow diagram of an algorithm for controlling the state of the locking differential.” Spec. 3:19–20, Fig. 6. If the decision at step 152 were modified to determine whether the above conditions (i) and

⁴ The Specification was amended subsequently to refer to step “152” instead of step “162,” which is consistent with the description, at column 8, lines 19–26, of Figure 6. Amendment 4 (filed Aug. 13, 2013).

(ii) are present, then a “no” would lead to “disengage differential & prevent its engagement” at step 162 and a “yes” would lead to “engage differential” at step 160. In other words, Figure 6 illustrates that if the steering wheel is displaced from a centered position *less than* a reference displacement angle, and (ii) the lateral acceleration of the vehicle 100 is *less than* a reference lateral vehicle acceleration, then “disengage differential & prevent its engagement.”

Nevertheless, we do not sustain the Examiner’s rejection of claims 2 and 8 under 35 U.S.C. § 112, first paragraph, for a different reason. Namely, as discussed below, claims 2 and 8 are ambiguous and, as such, the Examiner’s findings regarding whether the Specification properly discloses the subject matter claimed was based necessarily on speculation and assumptions about the scope and meaning of these claims, which is improper. *See In re Steele*, 305 F.2d 859, 862 (CCPA 1962) (explaining that rejections should not be based on speculations and assumptions as to the scope and meaning of claims). Therefore, we do not sustain the Examiner’s rejection of claims 2 and 8 under 35 U.S.C. § 112, first paragraph.

Claims 2 and 8 are properly rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor regards as the invention.

In determining whether a claim is definite, “[t]he USPTO, in examining an application, is obliged to test the claims for reasonable precision.” *In re Packard*, 751 F.3d 1307, 1313 (Fed. Cir. 2014), *cert. denied, sub nom. Packard v. Lee*, 135 S. Ct. 2310 (mem) (2015).

Importantly, “we employ a lower threshold of ambiguity when reviewing a

pending claim for indefiniteness than those used by post-issuance reviewing courts.” *Ex parte Miyazaki*, 89 USPQ2d 1207, 1211 (BPAI 2008) (precedential). In particular, we have held that “if a claim is amenable to two or more plausible claim constructions, the USPTO is justified in requiring the applicant to more precisely define the metes and bounds of the claimed invention by holding the claim unpatentable under 35 U.S.C. § 112, second paragraph, as indefinite.” *Id.* We have “a duty to guard the public against patents of ambiguous and vague scope” and are

justified in using a lower threshold . . . because the applicant has an opportunity and a duty to amend the claims during prosecution to more clearly and precisely define the metes and bounds of the claimed invention and to more clearly and precisely put the public on notice of the scope of the patent.

Id.

Claims 2 and 8 are ambiguous for two reasons. First, the claims state, “wherein step (b) further comprises *determining*” (emphasis added); therefore, it is unclear whether step (b) requires simply making a determination the recited conditions exist, or requires unlocking the differential and preventing its engagement provided the recited conditions exist. Second, presuming the latter was intended, it is unclear whether the recited conditions are additional *alternative* (i.e., “or”) conditions that may independently lead to unlocking the differential, or additional *cumulative* (i.e., “and”) conditions that must exist in addition to at least one of the other alternative conditions that claims 1 and 7, at step (b), identify to unlock the differential. In view of these ambiguities, we reject claims 2 and 8 under 35 U.S.C. § 112, second paragraph, as a NEW GROUND OF REJECTION pursuant to 37 C.F.R. § 41.50(b).

Claims 3 and 9

Claims 3 and 9 present similar issues to those discussed above, except these claims refer to “step (a)” of claims 1 and 7, respectively. Appeal Br. 18, 19. Step (a) of claims 1 and 7 require “locking the differential” provided several conditions are present, and claims 3 and 9 further recite:

wherein step (a) *further comprises determining* that an angular displacement of a steering wheel from a centered position is *greater than* a reference angle, and that lateral acceleration of the vehicle is *greater than* a reference lateral acceleration.

Id. (emphasis added). The Examiner finds the Specification fails to disclose the subject matter of claims 3 and 9. Final Act. 9, 10. In response, Appellants assert, “[t]he flow chart of figure 6 shows this in steps, which are described in the specification, p. 8, line 19 to p. 9, line 4.” Appeal Br. 6–8. The Examiner counters, “Fig. 6 itself does not discuss either angular displacement or lateral acceleration, and the Specification describes almost the opposite of Applicant’s claim 3,” moreover, “[t]he Specification is silent as to a lateral acceleration when determining when to lock the differential.” Ans. 13–15. Thus, the Examiner appears to understand the Specification as describing locking the differential if the angular displacement of a steering wheel is *less than* a reference angle and devoid of any disclosure of locking the differential if the vehicle’s lateral acceleration is *greater than* a reference lateral acceleration. *Id.*

We disagree with the Examiner’s interpretation of the Specification for the following reasons. As noted above, the Specification states, “Step 162 may also include determining that (i) the steering wheel is displaced from a centered position greater than a reference displacement angle, and (ii) the lateral acceleration of the vehicle 100 is greater than a reference lateral

vehicle acceleration.” Spec. 8 (as filed Oct. 1, 2009).⁵ Referring again to Figure 6, if the decision at step 152 were modified to determine whether the above conditions (i) and (ii) are present, then a “yes” would lead to “engage differential” at box 160. In other words, Figure 6 illustrates that if the steering wheel is displaced from a centered position *greater than* a reference displacement angle, and (ii) the lateral acceleration of the vehicle 100 is *greater than* a reference lateral vehicle acceleration, then “engage differential.”

However, we do not sustain the Examiner’s rejection of claims 3 and 9 under 35 U.S.C. § 112, first paragraph, for a different reason. Claims 3 and 9 are ambiguous and, therefore, the Examiner’s findings regarding whether the Specification properly discloses the subject matter claimed was necessarily based on speculation and assumptions about the scope and meaning of these claims, which is improper. *See In re Steele*, 305 F.2d at 862. Therefore, we do not sustain the Examiner’s rejection of claims 3 and 9 under 35 U.S.C. § 112, first paragraph.

Claims 3 and 9 are properly rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor regards as the invention.

Claims 3 and 9 are ambiguous for two reasons. First, the claims state, “wherein step (a) further comprises *determining*” (emphasis added); therefore, it is unclear whether step (a) requires simply making a

⁵ The Specification was amended subsequently to refer to step “152” instead of step “162,” which is consistent with the description, at column 8, lines 19–26, of Figure 6. Amendment 4 (filed Aug. 13, 2013).

determination the recited conditions exist, or requires locking the differential provided the recited conditions exist. Second, presuming the latter is the intended meaning, it remains unclear whether the recited conditions are additional *alternative* (i.e., “or”) conditions that may independently lead to locking the differential, or additional *cumulative* (i.e., “and”) conditions that must exist in addition to all of the other conditions claims 1 and 7, at step (a), identify to lock the differential. In view of these ambiguities, we reject claims 3 and 9 under 35 U.S.C. § 112, second paragraph, as a NEW GROUND OF REJECTION pursuant to 37 C.F.R. § 41.50(b).

Rejection II

Claims 1 and 7 are directed to methods “for controlling a locking differential of a motor vehicle.” Appeal Br. 18, 19 (Claims App.). Both methods control a differential by

(a) locking the differential, *provided* yaw acceleration of the vehicle is greater than a reference yaw acceleration *and* a wheel speed differential is greater than a reference wheel speed differential; and

(b) unlocking the differential and preventing its engagement, *provided* vehicle speed is not less than the reference speed, *or* yaw acceleration of the vehicle is not greater than the reference yaw acceleration *or* the wheel speed differential is not greater than the reference wheel speed differential.

Id. (emphasis added). In claim 1, to lock the differential in step (a), an additional condition must be present — namely, “the vehicle speed is less than a reference speed.” *Id.*

The Examiner finds Marathe and Piyabongkarn in combination render obvious each of the conditions recited in steps (a) and (b) for locking or unlocking a differential, respectively. Final Act. 12. In particular, the

Examiner relies on Marathe for every locking/unlocking condition, except “locking the differential, provided that yaw acceleration of the vehicle is greater than a reference yaw acceleration.” *Id.* The Examiner finds, however, that Piyabongkarn “teaches locking the differential, provided that yaw acceleration of the vehicle is greater than a reference yaw acceleration.” *Id.* at 13 (citing Piyabongkarn ¶ 45). The Examiner concludes,

it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teaching of Marathe by configuring step (a) to comprise locking the differential provided vehicle speed is less than a reference speed, yaw acceleration of the vehicle is greater than a reference yaw acceleration and a wheel speed differential due to wheel slip is greater than a reference wheel speed differential as taught by Piyabongkarn in order to enhance the vehicle lateral dynamics while preserving longitudinal motion by providing yaw damping control.

Id. (citing Piyabongkarn ¶¶ 8, 45–48).

Appellants argue the Examiner’s obviousness determination is flawed fatally because neither Marathe nor Piyabongkarn disclose, alone or in combination, controlling a differential by locking it when the yaw acceleration of the vehicle is greater than a reference yaw acceleration *and* the wheel speed differential is greater than a reference wheel speed, and unlocking the differential *and preventing its engagement* when any one of the conditions step (b) recites occurs. Appeal Br. 10–12; *see also id.* at 8–9. Appellants contend the facts do not support the Examiner’s conclusion it would have been obvious to combine Marathe and Piyabongkarn to reach

the claimed combination of conditions necessary to lock/unlock a differential. *Id.*

Appellants also point out that Marathe teaches locking a differential even when there is no wheel speed differential. *Id.* at 11–12 (citing Marathe ¶¶ 28, 29, 32). Appellants argue this fact shows Marathe does not consider wheel speed differential as a necessary predicate to locking the differential. *Id.*

Appellants also note, Piyabongkarn teaches *activating* the yaw damping controller only after the vehicle speed is *above* a predetermined vehicle speed and, therefore, that controller only causes the differential to lock in response to yaw acceleration after the vehicle is above a reference speed. *Id.* at 12 (citing Piyabongkarn ¶¶ 41, 52). Appellants argue this fact leads away from the claimed combination of locking/unlocking conditions recited, which require *preventing* yaw acceleration from causing differential engagement (i.e., locking) after the vehicle speed is *greater than* (i.e., “not less than”) a reference speed. *Id.* Appellants contend the Examiner mistakenly relies on Marathe to teach *preventing* differential engagement when the vehicle speed is greater than a reference speed. *Id.* The Examiner is mistaken, according to Appellants, because Marathe’s disclosure of that operation “is for **below** a vehicle [speed] threshold, not **above** a speed threshold, which is what Piyabongkarn is teaching.” Reply Br. 4.

We are persuaded the Examiner’s reason for combining Marathe and Piyabongkarn lacks a rational underpinning, when the claimed subject matter is considered as a whole. In particular, the claimed locking differential controller requires unlocking and preventing engagement of the differential when the conditions of step (a) are satisfied, provided vehicle

speed is greater than the reference speed. While we agree with the Examiner that Marathe shows a skilled artisan knew a differential could be unlocked and prevented from engagement when the vehicle speed is greater than a reference speed, the Examiner does not persuasively show it would have been obvious to have a controller that does so when the conditions of step (a) are present.

The Examiner determines a skilled artisan would have been lead to the claimed combination “in order to enhance the vehicle lateral dynamics while preserving longitudinal motion by providing yaw damping control.” Final Act. 13 (citing Piyabongkarn ¶¶ 8, 45–48). Piyabongkarn teaches, however, that the yaw damping control is enabled only after the vehicle speed is greater than a reference speed and Marathe is completely silent about the use of a yaw damping control to lock/unlock a differential. The Examiner never explains why a skilled artisan would have recognized the yaw damping control would provide the same benefits when *it cannot* lock a differential at vehicle speeds greater than a reference speed. Absent such a showing, the Examiner’s obviousness rejection lacks a rational underpinning. Therefore, we do not sustain the Examiner’s rejection of claims 1 and 7.

Rejection III

For the reasons discussed above (*supra* Rejection I), claims 2 and 8 are ambiguous and, as such, the Examiner’s findings regarding whether those claims are unpatentable was based necessarily on speculation and assumptions about the scope and meaning of the claims, which is improper.

See In re Steele, 305 F.2d at 862. Therefore, we do not sustain the Examiner's rejection of claims 2 and 8 as being unpatentable.

Rejections IV–VII

The Examiner's use of the teachings of Newberry, Zalewski, Carlen, Fischle, Yoneda, and Rodeghiero, respectively, does not cure the deficiencies in Rejection II, as discussed *supra*. *See* Final Act. 16–20.

Therefore, for the same reasons as discussed above, we also do not sustain the rejections under 35 U.S.C. § 103(a) of claims 4 and 16 as unpatentable over Marathe, Piyabongkarn, Newberry, and Zalewski; of claims 6 and 10 as unpatentable over Marathe, Piyabongkarn, and Fischle; of claim 17 as unpatentable over Marathe, Piyabongkarn, Newberry, Carlen, Rodeghiero, and Yoneda; and of claim 18 as unpatentable over Marathe, Piyabongkarn, Newberry, Zalewski, and Rodeghiero.

DECISION

We reverse the Examiner's written description rejection of claims 2, 3, 8, and 9.

We reject claims 2, 3, 8, and 9 under 35 U.S.C. § 112, second paragraph, as a NEW GROUND OF REJECTION pursuant to 37 C.F.R. § 41.50(b).

We reverse the Examiner's rejection of claims 1, 2, 4, 6–8, 10, and 16–18 under 35 U.S.C. § 103(a) as unpatentable.

FINALITY OF DECISION

This decision contains a new ground of rejection pursuant to 37 C.F.R. § 41.50(b). 37 C.F.R. § 41.50(b) provides “[a] new ground of

rejection pursuant to this paragraph shall not be considered final for judicial review.” 37 C.F.R. § 41.50(b) also provides:

When the Board enters such a non-final decision, the appellant, within two months from the date of the decision, must exercise one of the following two options with respect to the new ground of rejection to avoid termination of the appeal as to the rejected claims:

(1) *Reopen prosecution.* Submit an appropriate amendment of the claims so rejected or new Evidence relating to the claims so rejected, or both, and have the matter reconsidered by the Examiner, in which event the prosecution will be remanded to the Examiner. The new ground of rejection is binding upon the examiner unless an amendment or new Evidence not previously of Record is made which, in the opinion of the examiner, overcomes the new ground of rejection designated in the decision. Should the examiner reject the claims, appellant may again appeal to the Board pursuant to this subpart.

(2) *Request rehearing.* Request that the proceeding be reheard under § 41.52 by the Board upon the same Record. The request for rehearing must address any new ground of rejection and state with particularity the points believed to have been misapprehended or overlooked in entering the new ground of rejection and also state all other grounds upon which rehearing is sought.

Further guidance on responding to a new ground of rejection can be found in the Manual of Patent Examining Procedure § 1214.01.

REVERSED; 37 C.F.R. § 41.50(b)