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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ERICK MICHAEL LAVOIE, NATHANIEL A. ROLFES,
BRADLELY G. HOCHREIN, DARREL ALAN RECKER,
DONALD JACOB MATTERN, and MICHAEL HAFNER

Appeal 2017-011364
Application 14/618,368
Technology Center 3600

Before LINDA E. HORNER, STEVEN D.A. McCARTHY, and
LISA M. GUIJT, *Administrative Patent Judges*.

GUIJT, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants[1] appeal under 35 U.S.C. § 134(a) from the Examiner's
rejection[2] of claims 16–18 and 20–25. We have jurisdiction under 35 U.S.C.
§ 6(b).

We REVERSE.

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[1] Appellants identify the real party in interest as Ford Global Technologies,
LLC. Appeal Br. 1. Ford Global Technologies, LLC is also the Applicant
under 37 C.F.R. section 1.46(a).
[2] Appeal is taken from the Final Office Action dated August 9, 2016.

STATEMENT OF THE CASE

Claim 16, the sole independent claim on appeal, reproduced below with disputed limitations italicized for emphasis, is exemplary of the subject matter on appeal.

> 16.   A method of controlling a speed of a motor vehicle and trailer, comprising:
>> utilizing a controller to:
>>> determine a desired vehicle and trailer path while the vehicle is moving in reverse utilizing input from a rotatable knob inside the vehicle;
>>> limit a speed of a vehicle such that the vehicle does not exceed a maximum allowable speed *for a measured trailer angle* and moves along the desired vehicle path within predefined error criteria.

THE REJECTIONS

I.   Claims 16, 17, 21, and 23–25 stand rejected under 35 U.S.C. § 103 as unpatentable over Hoel (WO 2014/092611 A1; published June 19, 2014)[3] and Pliefke (US 2015/0217693 A1; published Aug. 6, 2015).

II.   Claim 18 stands rejected under 35 U.S.C. § 103 as unpatentable over Hoel, Pliefke, and Morishita (US 4,754,828; issued July 5, 1988).

III.   Claim 20 stands rejected under 35 U.S.C. § 103 as unpatentable over Hoel, Pliefke, and Guarnizo Martinez (US 2014/0142798 A1; published May 22, 2014).

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[3] Although the copy of WO 2014/092611 A1 on the record appears to be in English, we rely on the corresponding publication, US 2015/0298738 A1 (published October 22, 2015), as an English language translation, as relied on by the Examiner. *See* Final Act. 5.

IV.   Claim 22 stands rejected under 35 U.S.C. § 103 as unpatentable over Hoel, Pliefke, and Sabelström (US 2010/0063702 A1; published Mar. 11, 2010).

ANALYSIS

Rejection I

Regarding independent claim 16, the Examiner finds, *inter alia*, that Hoel "does in fact have a trailer angle" and that Hoel "determines the maximum speed for a reversing vehicle-trailer comb[ination] based on many variables, one of them being a trailer angle." Ans. 6 (citing Hoel ¶ 33, Fig. 2). The Examiner determines that the trailer angle disclosed in Hoel is "measured and used in the calculations of the maximum speed." Ans. 6 (citing Hoel ¶¶ 23–26). In particular, the Examiner finds that "Hoel does not just predetermine the route of the vehicle-trailer combination before reversing, it also *measures angles* of the vehicle-trailer combination, *while backing up* and further controls the maximum speed of the vehicle-trailer combination based on '*measured angles*.'" Ans. 8 (citing Hoel ¶ 39) (emphasis added); *cf.* Final Act. 5 ("Hoel does not disclose . . . using a 'measured trailer angle'").

Appellants argue that the Examiner's reliance on Hoel for disclosing "measuring an articulation angle (trailer angle)" is based on "an erroneous interpretation of the Hoel disclosure," because "Hoel itself clearly distinguishes the 'pre-calculated values' from the simulation with actual measured values," and "[t]he assertion that the articulation angle (a 'pre-

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calculated value') is a measured angle is <u>directly</u> contrary to Hoel itself."[4]
Reply Br. 4 (citing Hoel ¶ 39). Appellants submit that "[i]n Hoel, the
articulation (trailer angle) is <u>only</u> used in the predefined simulation that
occurs in advance, <u>before the vehicle moves</u>." *Id.* at 5.

Paragraph 39 of Hoel discloses that:

> It is thus possible to determine a maximum speed limit
> . . . based on predefined limiting conditions of . . . the vehicle
> combination[5] . . . . In addition to limiting the speed to these pre-
> calculated values, it is also possible to *measure actual values*
> during the actual reversing of the vehicle combination, e.g., to
> measure the actual steering actuator rate and *the actual lateral
> acceleration* during the manoeuvre. If the maximum values of
> the *measured units* [(e.g., $\alpha_{lat,max}$)][6] are exceeded, the speed can
> be dynamically decreased during the manoeuvre. In this way,
> [the] determined maximum speed limit can be overridden by the
> actual measured values, should e.g.[,] the load on the vehicle
> combination cause the vehicle combination to behave in a
> different way than expected.

(Emphasis added).

Regarding *lateral acceleration* (i.e., the measured actual value or the
measured unit), Hoel discloses, in the context of the simulation, that:

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[4] Although Appellants contend that "the Examiner's Answer is inconsistent
with the [F]inal Office Action," Appellants did not file a petition, but rather
submitted a Reply Brief. Reply Br. 3–4; *see* 37 C.F.R. § 41.40(a) ("[a]ny
request to seek review of the primary examiner's failure to designate a
rejection as a new ground of rejection in an examiner's answer must be by
way of a petition to the Director").

[5] *See, e.g.,* Hoel ¶ 20 (disclosing, with reference to "a kinematic vehicle
model of a tractor-semitrailer vehicle combination" shown in Figure 2, that
"[t]he vehicle combination contains two rigid bodies attached by a joint
which has one rotational degree of freedom").

[6] *See* WO 2014/092611, p. 11, l. 19.

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it is also possible to limit the speed in sharp turns, in order to limit the lateral forces experienced by the driver and/or imposed on the load. *This maximum lateral acceleration is* $\alpha_{lat,max}$. *The simulation gives values for* ϕ^{7}, δ^{8} *and* $\partial\delta/\partial s$, *along the path.* From this, the maximum speed . . . $v_1(s)$ is given by the solution to the differential equation

$$\alpha_{lat,max} = \frac{\partial v_1}{\partial s} v_1 \cos \phi \left(1 - \frac{C}{L_1} tan\phi \tan \delta \right) \tan \delta$$

$$+ v_1^2 \left(cos\phi \left(1 - \frac{C}{L_1} tan\phi \tan \delta \right) \frac{1}{cos^2\delta} \frac{\partial\delta}{\partial s} + \frac{tan\delta}{L_1} \right)$$

using the boundary condition $[v_1(s_{final})] = 0$, i.e. the vehicle is going [t]o stop at the end of the path. . . .

In this way, a maximum speed limit for the vehicle can be determined during a reverse assistance manoeuvre.

Id. ¶¶ 33–35 (emphasis added).

Thus, Hoel discloses *calculating* a maximum lateral acceleration (i.e., $\alpha_{lat,max}$) using values given by a simulation for the articulation (or trailer) angle (ϕ) (in addition to steering angle δ), and separately, Hoel discloses *measuring* actual values (while the vehicle is reversing), wherein an example of a value, or unit, that is *measured* is the actual lateral acceleration. However, Hoel is silent with respect to measuring an actual value for angles, including articulation angle ϕ. Further, Hoel is silent as to *how* to measure the actual lateral acceleration; for example, Hoel does not disclose that the measurement of trailer angle ϕ (or even steering angle δ) is required to

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[7] Hoel discloses that the variable ϕ is "the articulation angle" (Hoel ¶ 24), and Appellants do not dispute the Examiner's finding that "an 'articulation angle (phi) . . . is known in the art as a trailer angle" (Ans. 6).
[8] Hoel discloses that the variable δ is "the steering angle." Hoel ¶ 24.

measure the actual lateral acceleration. Thus, the Examiner's reliance on Hoel's use of a trailer angle ϕ as a variable in the simulation equations as a disclosure of measuring trailer angle ϕ when determining an actual lateral acceleration is not adequately supported by Hoel.

Additionally, the Examiner relies on Pliefke for disclosing using a measured trailer angle while the vehicle is moving in reverse, and reasons that it would have been obvious

> to incorporate the teachings of Pliefke into the invention of Hoel *to not only include speed limitations when backing up a vehicle based on angles as Hoel discloses* but to also allow the system to control the vehicle while backing up, with a knob, and finally with using a measured angle as taught by Pliefke with a motivation of "[t]he driver of the vehicle may manually adjust the steering of the vehicle to more accurately or precisely steer the vehicle in the desired direction..." [and s]ince the claimed invention is merely a combination of old, well known elements back up assist systems with trailers and in the combination each element merely would have performed the same function as it did separately, and one of ordinary skill in the art before the effective filing date of the claimed invention would have recognized that the results of the combination would have been predictable.

Final Act. 5–6 (citing Pliefke, Abstract, ¶¶ 5, 18, 25, 28) (emphasis added); *see also* Ans. 7 ("Pliefke . . . was introduced . . . to further teach that 'measuring a trailer angle' as to 'calculating a trailer angle' during backing up of a vehicle is known"); *id.* at 9 ("if Hoel was not to be understood as having a 'measured trailer angle', Pliefke would further teach this").

Appellants argue, *inter alia*, that Pliefke discloses measuring the tracker angle for use in a "'steering algorithm' that 'attempts to <u>steer</u> the trailer . . . to control the <u>direction</u> of the trailer . . . , **not the speed**." Appeal Br. 3 (citing Pliefke ¶¶ 19, 21, 22, 25); *see also id.* at 5 ("Pliefke discloses

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use of a trailer angle to control **steering**, not vehicle speed."). Appellants submit that, absent hindsight, one "would not select a measured input variable utilized in the 'steering algorithm,'" as disclosed in Pliefke, "to determine a maximum vehicle speed," as disclosed in Hoel. *Id.* at 3.

We are persuaded by Appellants' argument that the Examiner's reliance on Pliefke for disclosing measuring a trailer angle to determine steering does not cure the deficiency in the Examiner's erroneous reliance on Hoel for disclosing measuring a trailer angle to determine speed, as discussed *supra*. Nor does the Examiner provide sufficient rationale that one skilled in the art would have measured the trailer angle, in view of Pliefke's teaching that the trailer angle may be measured to determine steering, in order to determine the actual lateral acceleration, as disclosed by Hoel, as discussed *supra*. *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1143 (Fed.Cir.1985) ("When prior art references require selective combination by the court to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gleaned from the invention itself.").

Accordingly, we do not sustain the Examiner's rejection of independent claim 16, and of claims 17, 21, and 23–25 depending therefrom.
Rejections II–IV

The Examiner's reliance on Morishita, Guarnizo Martinez, and Sabelströem in the rejection of claims 18, 20, and 22, which depend from independent claim 16, does not cure the deficiency in the Examiner's reliance on Hoel in the rejection of claim 16, as set forth *supra*. Therefore, for essentially the same reasons as stated *supra*, we also do not sustain the Examiner's rejection of claims 18, 20, and 22.

DECISION

The Examiner's rejections of claims 16–18 and 20–25 are REVERSED.

REVERSED