UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte HONGTEI E. TSENG, TIMOTHY G. OFFERLE, and
GREGORY P. BROWN

Appeal 2007-2076
Application 10/708,680
Technology Center 3600

Decided: December 20, 2007

Before MURRIEL E. CRAWFORD, HUBERT C. LORIN, and JENNIFER D. BAHR, *Administrative Patent Judges*.

BAHR, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Hongtei E. Tseng et al. (Appellants) appeal under 35 U.S.C. § 134 from the Examiner's decision rejecting claims 1-30. We have jurisdiction over this appeal under 35 U.S.C. § 6 (2002).

THE INVENTION

Appellants' claimed invention is directed to a method and apparatus for reducing the turning radius of a vehicle by brake-steering and for further reducing the turning radius of the vehicle by using a controllable suspension component (Spec. ¶ 2). Independent claims 1 and 17 are representative of the claimed invention and read as follows:

> 1. A method of controlling an automotive vehicle having a controllable suspension component, said vehicle having a first turning radius comprising:
>
> applying brake-steer to at least one wheel to provide a second turning radius less than the first turning radius;
>
> generating a suspension control signal in response to applying brake-steer; and
>
> articulating at least one wheel coupled to the controllable suspension component to provide a third turning radius of the vehicle less than the second turning radius.
>
> 17. A vehicle having a turning radius comprising:
>
> a suspension comprising a controllable suspension component; and
>
> a controller coupled to the controllable component, said controller programmed to determine a brake-steer condition and generate a suspension control signal in response to the brake-steer condition,
>
> said controllable suspension component actuating in response to the control signal and reducing the turning radius of the vehicle in response to the suspension control signal.

THE EVIDENCE

The Examiner relies upon the following as evidence of unpatentability:

Nordström	US 4,227,716	Oct. 14, 1980
Fukushima	US 4,903,983	Feb. 27, 1990
Kring	US 5,549,319	Aug. 27, 1996
Lee	US 5,560,640	Oct. 1, 1996
Krueger	US 6,481,806 B1	Nov. 19, 2002
Ritz	US 6,588,858 B2	Jul. 8, 2003
Wessman	US 6,612,394 B2	Sep. 2, 2003

THE REJECTIONS

Appellants seek review of the Examiner's rejections under 35 U.S.C. § 103(a) of claims 1, 2, 4-9, 11, 12, 15, 17-21, 27, 29, and 30 as unpatentable over Wessman in view of Fukushima; claims 3 and 23 as unpatentable over Wessman in view of Fukushima and Ritz; claims 10 and 22 as unpatentable over Wessman in view of Fukushima and Krueger; claims 13 and 24 as unpatentable over Wessman in view of Fukushima and Nordström; claims 14, 25, and 26 as unpatentable over Wessman in view of Fukushima and Lee; and claims 16 and 28 as unpatentable over Wessman in view of Fukushima and Kring.

The Examiner provides reasoning in support of the rejections in the Answer (mailed November 20, 2006). Appellants present opposing arguments in the Appeal Brief (filed September 11, 2006) and Reply Brief (filed January 10, 2007).

THE ISSUES

The first issue in this appeal is whether the combination of Wessman and Fukushima proposed by the Examiner is sufficient to establish that the subject matter of claim 1 would have been obvious to a person of ordinary skill in the art. This issue turns on whether the Examiner has articulated a reason that would have prompted a person of ordinary skill in the art to combine the references so as to generate a suspension control signal in response to applying brake-steer, as called for in claim 1.

The next issue presented in this appeal is whether the teachings of Wessman and Fukushima are sufficient to establish the subject matter of claim 17 would have been obvious to a person having ordinary skill in the art at the time of Appellants' invention. This issue turns on the construction of the claim language "brake-steer condition."

A third issue for our review is whether claim 22 is patentable over the combination of Wessman, Fukushima, and Krueger.

A fourth issue for our review is whether Appellants' argument demonstrates that claim 24 is patentable over the combination of Wessman, Fukushima, and Nordström.

OPINION

"Section 103 forbids issuance of a patent when 'the differences between the subject matter sought to be patented 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.*, 127 S.Ct. 1727, 1734 (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) where in evidence, so-called secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). *See also KSR*, 127 S.Ct. at 1734 ("While the sequence of these questions might be reordered in any particular case, the [*Graham*] factors continue to define the inquiry that controls.") It follows that all words in a claim must be considered in determinations as to whether the differences between the claimed subject matter and the prior art are such that the claimed 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. *See In re Wilson*, 424 F.2d 1382, 1385 (CCPA 1970).

There must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness, though "the 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*, 127 S.Ct. at 1741.

Claims 1-16

Wessman discloses a vehicle steering control device in which brake-steering is applied by braking the inside wheel when a signal from a sensor 5 arranged to detect at least one parameter, such as steering wheel position (col. 3, ll. 27-32), exceeds a predetermined value for a particular condition, in order to reduce the turning radius of the vehicle (Wessman abstract). The Examiner concedes that Wessman lacks disclosure of a controllable suspension component and articulation of at least one wheel coupled to the

controllable suspension component to provide a third turning radius less than the second turning radius, as called for in Appellants' claim 1 (Ans. 4).

Fukushima discloses a vehicle suspension system comprising adjustable dampers disposed between the vehicle body and a plurality of suspension members for producing damping forces against vertically exerted forces, first and second sensors for monitoring predetermined vehicle driving conditions indicating parameters, such as vehicular driving speed and vehicular steering conditions, to produce first and second sensor signals, and a controller responsive to the first and second sensor signals for detecting vehicle driving conditions on the basis thereof and deriving suspension control signals for controlling the damping characteristics of the dampers in order to adjust stiffness of respective suspension systems for adjusting load distribution at respective wheels for obtaining optimum cornering characteristics of the vehicle (col. 4, ll. 41-58). Fukushima's controller is responsive to the first and second sensor signals to adjust stiffness of respective suspension systems to provide over-steer characteristics of the vehicle (col. 4, ll. 59-63). The Examiner has not pointed to any teaching in Fukushima, nor do we find any such teaching, of generating a suspension control signal "in response to applying brake-steer," as called for in claim 1.

Even assuming the turning radius reduction technique of Wessman employing brake-steering were combined with the suspension adjustment technique of Fukushima in order to optimize turning characteristics of a vehicle, as proposed by the Examiner (Ans. 4), the Examiner has not explained, nor is it apparent, why a person of ordinary skill in the art would have been prompted to combine them in such a way that the suspension

control signal is generated "in response to applying brake-steer," as required in Appellants' claim 1, rather than in response to the first and second sensor signals indicating vehicular driving speed and steering conditions, respectively, as taught in Fukushima.

For the above reason, the Examiner has fallen short in establishing a prima facie case that the subject matter of claim 1 as a whole would have been obvious to a person of ordinary skill in the art at the time of Appellants' invention. The rejection of claim 1, and claims 2, 4-9, 11, 12, and 15 depending from claim 1, as unpatentable over Wessman in view of Fukushima is reversed.

The Examiner's application of Ritz, Krueger, Nordström, Lee, and Kring does not make up for the deficiency in the combination of Wessman and Fukushima discussed above. Therefore, the rejections of claims 3, 10, 13, 14, and 16, which depend from claim 1, are likewise reversed.

Claims 17-21, 23, and 25-30

Independent claim 17, unlike claim 1, does not require application of brake-steer or generation of a suspension control signal in response to application of brake-steer. Claim 17 requires "a controller coupled to the controllable component, said controller programmed to determine a brake-steer condition and generate a suspension control signal in response to the brake-steer condition."

In interpreting claim language, we apply the broadest reasonable meaning of the words in their ordinary usage as they would be understood by one of ordinary skill in the art, taking into account whatever enlightenment by way of definitions or otherwise that may be afforded by the written description. *See In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir.

1997). *See also In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004).

Appellants' Specification does not explicitly define "brake-steer condition" and the terminology itself appears to be broad enough to read on either a condition in which brake-steer is desired or a condition in which brake-steer is actually being applied. Appellants' Specification describes a step 218 which "may generate a steering enhance signal or other control signal based upon the sensing of the desirability for brake-steer" (Spec. ¶ 99). The Specification also describes a step 224 in which the normal load at selective wheels might be adjusted through suspension control or suspension modification and discloses that "[t]his *may* be done together with applying brake-steer in steps 220 or 222" (emphasis added), thereby reducing the turning radius of the vehicle further than brake-steer alone (Spec. ¶ 102). The use of the term "may" implies that the suspension control or modification may also be done without applying brake-steer. Further, in accordance with Appellants' disclosed invention, a suspension control signal may be generated by the controller to articulate the wheel based on the particular direction of the vehicle so that brake-steer may further enhance the turning radius of the vehicle (Spec. ¶ 105), thereby implying that the brake-steer application may be the second technique applied after application of suspension control or modification. Additionally, Appellants disclose that in step 240, suspension modification may be performed "alone or simultaneously with" applying brake-steer (Spec. ¶ 116).

In light of the above disclosure in Appellants' Specification, we conclude that the broadest reasonable interpretation of "brake-steer condition" is a condition in which brake-steering, or other steering control to

effectively reduce the turning radius of the vehicle, is desired. Accordingly, the limitation of claim 17 of a "controller programmed to determine a brake-steer condition and generate a suspension control signal in response to the brake-steer condition" is met by Fukushima's controller, which adjusts stiffness of respective suspension systems to provide over-steer characteristics of the vehicle in response to the first and second sensor signals (col. 4, ll. 59-63).

In light of our interpretation, *supra*, of the claim language "brake-steer condition" consistent with Appellants' Specification, Appellants' argument that Fukushima and Wessman do not teach or suggest generating a suspension control signal in response to the brake-steer condition (App. Br. 4-5) is not well founded. Appellants' argument seems to presume claim 17 requires brake-steering and generation of a suspension control signal in response to brake-steering, but claim 17 contains no such limitation. It is well established that limitations not appearing in the claims cannot be relied upon for patentability. *In re Self*, 671 F.2d 1344, 1348 (CCPA 1982). As stated by our reviewing court in *In re Hiniker Co.*, 150 F.3d 1362, 1369 (Fed. Cir. 1998), "the name of the game is the claim."

For the reasons discussed above, we conclude the subject matter of claim 17 is unpatentable over the combination of Wessman and Fukushima. We thus affirm the rejection of claim 17, as well as claims 18-21, 27, 29, and 30, which Appellants have not argued separately from claim 17, as unpatentable over the combined teachings of Wessman and Fukushima. We denominate the affirmance of this rejection as a new ground of rejection pursuant to 37 C.F.R. § 41.50(b), however, because the Examiner's rejection did not clearly articulate how "brake-steer condition" was being construed or

how the limitations with respect thereto are met by the applied references and because the rationale for our affirmance hinges on our interpretation of the terminology "brake-steer condition."

Appellants' arguments in favor of the patentability of claims 23, 25, 26, and 28 (App. Br. 5-6) simply rely on the argument asserted as to claim 17 and are thus unpersuasive for the reasons discussed above with respect to claim 17. We therefore affirm the rejections of these claims as well, also denominating them as new grounds of rejection pursuant to 37 C.F.R. § 41.50(b), for the reasons discussed above with respect to claim 17.

Claim 22

Claim 22 depends from claim 17 and further requires that "said controller determines a parking mode in response to a driver-actuated switch." As disclosed in Paragraph 95 of Appellants' Specification, the controller in accordance with Appellants' invention may determine the parking mode by using various combinations of sensors including, *inter alia*, a driver-actuated switch. It is thus clear that the claim terminology "in response to" in claim 22 does not require that the parking mode be determined solely or directly in response to a driver-actuated switch.

Although Wessman does not use the terminology "parking mode," Wessman discloses such (col. 2, ll. 11-18 and col. 3, l. 64 to col. 4, l. 27). Specifically, Wessman transmits position signals from the steering wheel angular position sensor 5 to the electronic control unit (ECU) to detect if the steering wheel is turned to its maximum limit position and in which direction the steering wheel has been turned. If the ECU determines that the steering wheel is turned to its maximum limit, or within a predetermined angular distance from its maximum limit, the ECU uses wheel rotation

sensors 3a, 3b, 4a, 4b to determine whether the vehicle is stationary or moving. If the vehicle moves at a velocity less than a predetermined limit, the ECU will transmit a signal to the brake actuator of the steered wheel on the side of the vehicle toward the inside of the turn. This condition in which the steering wheel is at or near its maximum limit and the vehicle is moving at a velocity less than the predetermined minimum can reasonably be considered "a parking mode." While each of the inputs, steering wheel angular position and vehicle speed, used by the ECU of Wessman to determine "a parking mode" is in part set or affected by driver-actuated mechanisms, namely, the steering wheel and the accelerator and brake pedals, none of these is described by Wessman as being a driver-actuated "switch."

As noted by the Examiner (Ans. 7 and 10), Krueger evidences that the use of a driver-actuated brake pedal switch to generate a brake application detection signal was known in the art at the time of Appellants' invention (col. 2, ll. 11-15 and 51-62). To incorporate a brake pedal switch into the Wessman vehicle as an input to the ECU, as a contribution to the input vehicle speed, to determine whether the vehicle is in a parking mode would have been merely an obvious combination of familiar elements according to their established functions yielding predictable results. "The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *KSR*, 127 S.Ct. at 1739. We must ask whether the improvement is more than the predictable use of prior art elements according to their established functions. *Id*. at 1740. Wessman, so modified in view of Krueger, thus comprises a controller (ECU) that

determines a parking mode in response to, albeit not solely in response to, a driver-actuated switch (the brake pedal switch).

In light of the above, we conclude the subject matter of claim 22 is unpatentable over the combination of Wessman, Fukushima, and Krueger. We affirm the rejection and denominate the affirmance as a new ground of rejection pursuant to 37 C.F.R. § 41.50(b), for the reasons discussed above regarding claim 17, from which claim 22 depends.

Claim 24

Claim 24 depends from claim 17 and further recites that the suspension comprises a Hotchkiss suspension. As noted by the Examiner (Ans. 7), Nordström evidences that a Hotchkiss suspension was a known suspension for vehicles at the time of Appellants' invention. To incorporate such a known suspension arrangement into Wessman, as modified in view of Fukushima by providing controlled suspension members to further assist in reducing turning radius (providing over-steer characteristics), is nothing more than the combination of familiar elements according to their established functions. Moreover, the incorporation of the known Hotchkiss suspension into the Wessman/Fukushima vehicle with adjustable dampers to adjust the suspension characteristics as needed for turning would not appear to have been uniquely challenging to a person of ordinary skill in the art and Appellants have not presented any evidence that such modification would have been beyond the technical grasp of a person having ordinary skill in the art. We thus conclude such incorporation of a Hotchkiss suspension into the Wessman/Fukushima vehicle would have been obvious to a person of ordinary skill in the art.

Appellants' argument that "no teaching or suggestion is provided for articulating a Hotchkiss suspension in response to brake-steer" (App. Br. 5) is not persuasive of error in the rejection of claim 24 because claim 24 contains no such limitation. Appellants thus fail to persuade us that claim 24 is patentable over the combination of Wessman, Fukushima, and Nordström. We affirm the rejection of claim 24, denominating the affirmance as a new ground of rejection pursuant to 37 C.F.R. § 41.50(b) for the reasons set forth above in regard to claim 17, from which claim 24 depends.

SUMMARY

The decision of the Examiner to reject claims 1-30 under 35 U.S.C. § 103(a) is reversed as to claims 1-16 and affirmed as to claims 17-30. For the reasons discussed above, we denominate our affirmance of the rejections of claims 17-30 as new grounds of rejection pursuant to 37 C.F.R. § 41.50(b).

This decision contains new grounds 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 that Appellants, WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of the following two options with respect to the new grounds 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 proceeding will be remanded to the examiner. . . .

> (2) Request rehearing. Request that the proceeding be reheard under § 41.52 by the Board upon the same record. . . .

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv) (2007).

AFFIRMED-IN-PART; 37 C.F.R. § 41.50(b)

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