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PATENT OFFICE  
BOARD OF PATENT APPEALS  
AND INTERFERENCES

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

This opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 12

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

*Ex parte* WILLIAM CHIN-WOEI LIN  
and DAVID M. SIDLOSKY

Appeal No. 94-2776  
Application 07/712,287<sup>1</sup>

ON BRIEF

Before JERRY SMITH, BARRETT and FLEMING, *Administrative Patent Judges*.

FLEMING, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 13 through 15. Claims 1 through 12 have been cancelled.

<sup>1</sup> Application for patent filed June 10, 1991.

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The invention is directed to a method and apparatus for producing a vehicle speed estimation for use in antilock brake control. Appellants disclose on page 1 of the specification that it is important to have good vehicle speed information as a base reference against which wheel speed during braking can be compared so that the amount of wheel slip can be determined. Appellants disclose that it is well known to use a chassis accelerometer to measure vehicle speed but this method is subject to error if the vehicle is on a slope. Appellants disclose on page 2 of the specification that it is the object of their invention to provide a method and apparatus for a precise and time-efficient way of estimating vehicle speed using a chassis accelerometer. On page 5 of the specification, Appellants disclose that Figure 1 illustrates the vehicle brake system in which a wheel speed sensor and a chassis accelerometer 22 provide input signals to controller 16.

Appellants disclose on page 9 of the specification that the routine for estimating wheel speed is depicted in the flowchart of Figure 4. Appellants disclose that if the brake switch is not on, then the accelerometer bias A is determined from the difference of the wheel acceleration determined by the wheel speed sensor and the chassis acceleration determined by the chassis accelerometer in block 110. If the brake switch is on, then the speed of the wheels is determined by reading the

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accelerometer in block 118 and computing the wheel speed using the accelerometer reading corrected by the previously calculated accelerometer bias A.

The independent claim 13 is reproduced as follows:

13. In a vehicle having wheels with wheel speed sensors providing a measure of wheel speed, wheel brakes for braking said wheels, a brake application sensor providing an indication of operation of said wheel brakes for braking said vehicle, and a chassis accelerometer providing a measure of vehicle acceleration that is offset from actual vehicle acceleration due to vehicle inclination, a method of estimating vehicle speed during operation of said brakes for braking said vehicle, the method comprising the steps of:

prior to said brake application sensor providing said indication of operation of said wheel brakes, (A) determining actual vehicle speed as represented by said measure of wheel speed provided by said wheel speed sensors, (B) determining actual vehicle acceleration from said determined actual vehicle speed, and (C) determining a difference between said determined actual vehicle acceleration and said measure of vehicle acceleration provided by said chassis accelerometer, said difference comprising an accelerometer bias, and

while said brake application sensor provides said indication of operation of said wheel brakes, (A) subtracting said accelerometer bias from said measure of vehicle acceleration provided by said chassis accelerometer to obtain a corrected measured vehicle acceleration and (B) estimating vehicle speed by integrating said corrected measured vehicle acceleration from an initial vehicle speed value equal to a last determined actual vehicle speed prior to said indication of operation of said wheel brakes.

The Examiner relies on the following references:

Bremer	3,953,080	Apr. 27, 1976
Matsuda	5,058,020	Oct. 15, 1991
		(filing date Mar. 28, 1989)

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In the Examiner's final rejection, the Examiner rejected claims 13 through 15 under 35 U.S.C. § 103 as being unpatentable over Matsuda and Bremer.

Rather than reiterate the arguments of Appellants and the Examiner, reference is made to the briefs and answer for the respective details thereof.

OPINION

We will not sustain the rejection of claims 13 through 15 under 35 U.S.C. § 103.

The Examiner has failed to set forth a prima facie case. It is the burden of the Examiner to establish why one having ordinary skill in the art would have been led to the claimed invention by the reasonable teachings or suggestions found in the prior art, or by a reasonable inference to the artisan contained in such teachings or suggestions. See In re Sernaker, 702 F.2d 989, 217 USPQ 1 (Fed. Cir. 1983). "Additionally, when determining obviousness, the claimed invention should be considered as a whole; there is no legally recognizable 'heart' of the invention." Para-Ordnance Manufacturing v. SGS Importers International, 73 F.3d 1085, 1087, 37 USPQ2d 1237, 1239, (Fed. Cir. 1995) citing W. L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 1548, 220 USPQ 303, 309 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984).

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Appellants point out in the reply brief that both Matsuda and Bremer determine velocity of the vehicle with only the use of vehicle wheel sensors and do not use a chassis accelerometer. Appellants argue that the appealed claims provide for both determining vehicle acceleration based on the output of a wheel sensor and a measurement of vehicle acceleration by a chassis accelerometer. Appellants further argue that the appealed claims provide that the vehicle accelerometer measurement is offset from actual vehicle acceleration due to vehicle inclination. Appellants further argue that prior to the brake being applied, the chassis accelerometer bias is determined. When the brake is applied, the vehicle speed is determined by subtracting the accelerometer bias from the measured vehicle acceleration provided by the chassis accelerometer. Appellants argue that both Matsuda and Bremer fail to teach these limitations recited in Appellants' claims.

Upon reviewing Appellants' claims, we find that the claims are limited to a "chassis accelerometer providing a measurement of vehicle acceleration that is offset from actual vehicle acceleration due to vehicle inclination". Furthermore, Appellants' claims recite either apparatus or method steps that determine "an accelerometer bias" prior to braking and vehicle speed during braking by "subtracting said accelerometer bias from said measure of vehicle acceleration provide by said chassis

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accelerometer to obtain a corrected measured vehicle acceleration".

The Examiner admits on page 8 of the answer that neither Matsuda nor Bremer teach the chassis accelerometer. The Examiner argues that "Matsuda discloses a means for determining the acceleration of the vehicle" and that the "chassis accelerometer of the present invention [Appellants' invention] is basically the same as the wheel accelerometer of the prior art."

We note that Matsuda teaches in column 2, line 18, through column 3, line 16, that the wheel acceleration is derived from a wheel speed sensor. In column 6, line 9, through column 7, line 65, Matsuda teaches that Figure 1 shows the overall wheel slip control system including a wheel speed sensor 26. In column 8, line 55, through column 9, line 22, Matsuda teaches the details of the wheel speed sensor 26. Matsuda teaches that the sensor 26 comprises a sensor rotor adapted to rotate with the vehicle wheel which generates a pulse signal having a frequency proportional to the rotation speed of the wheel. Thus, Matsuda does not teach a chassis accelerometer providing a measure of vehicle acceleration that is offset from actual vehicle acceleration due to vehicle inclination.

Similarly, Bremer does not teach a chassis accelerometer that provides a measure of vehicle acceleration that is offset from actual vehicle acceleration due to vehicle inclination as

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recited in Appellants' claims. Bremer teaches in column 2, line 59, through column 3, line 10, that Figure 1 shows the anti-lock brake control that derives acceleration from the measured wheel speed provided by tachometers 12 and 12'. Bremer further discloses that the tachometers are toothed wheel variable reluctance, electromagnetic transducers and the tachometers provide signals having a frequency proportional to the wheel speed.

We are not inclined to dispense with proof by evidence when the proposition at issue is not supported by a teaching in a prior art reference, common knowledge or capable of unquestionable demonstration. Our reviewing court requires this evidence in order to establish a *prima facie* case. In re Knapp-Monarch Co., 296 F.2d 230, 232, 132 USPQ 6, 8 (CCPA 1961). In re Cofer, 354 F.2d 664, 668, 148 USPQ 268, 271-72 (CCPA 1966).

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We have not sustained the rejection of claims 13 through 15 under 35 U.S.C. § 103. Accordingly, the Examiner's decision is reversed.

**REVERSED**

*Jerry Smith*  
JERRY SMITH

Administrative Patent Judge )

*Lee E. Barrett*

LEE E. BARRETT )

Administrative Patent Judge )

*Michael R. Fleming*

MICHAEL R. FLEMING )

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