The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte RICHARD E. GADY and STEPHEN A. FEDERIGHE

Appeal 2006-1399
Application 10/666,712
Technology Center 3600

Decided: March 21, 2007

Before MURRIEL E. CRAWFORD, JENNIFER D. BAHR, and ROBERT E. NAPPI, *Administrative Patent Judges*.

CRAWFORD, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

This appeal involves claims 15 to 35, the only claims pending in this application. Claims 1 to 14 have been canceled. We have jurisdiction over the appeal pursuant to 35 U.S.C. § 6(b) (2002).

The claims are directed to a transfer case assembly. Claims 15 and 26 are illustrative:

15. A transfer case assembly comprising:

an input shaft adapted to be coupled to a power source;

a first axle output shaft driven by said input shaft;

a second axle output shaft selectively driven by said input shaft;

a clutch mechanism for coupling said second axle output shaft to said first axle output shaft; and

a controller for controlling activation of said clutch mechanism wherein said controller compares rotational speeds of said first and second axle output shafts to each other, generates a control signal to bring said rotational speeds of said first and second axle output shafts within a common rotational speed range if rotational speeds of said first and second axle output shafts differ from each other by a predetermined amount, and activates said clutch mechanism to couple said first and second axle output shafts together during a wheel slippage condition when rotational speeds of said first and second axle output shafts are within said common rotational speed range.

26. A method for coupling a transfer case to a drive axle during wheel slippage comprising the steps of:

(a) providing an input shaft adapted to be coupled to a power source, a first axle output shaft driven by the input shaft, a second axle output shaft selectively driven by the input shaft, and a clutch mechanism for coupling the second axle output shaft to the first axle output shaft;

(b) comparing rotational speeds of the first and second axle output shafts to each other;

(c) generating a control signal to bring the rotational speeds of the first and second axle output shafts within a common rotational

speed range if the rotational speeds of the first and second axle output shafts are different from each other by a predetermined amount; and

(d) activating the clutch mechanism to couple the first and second axle output shafts together during a wheel slippage condition once the rotational speeds of the first and second axle output shafts are within the common rotational speed range.

The Examiner relies on the following prior art reference to show unpatentability:

Yasuda	6,115,663	Sep. 5, 2000

The rejections as presented by the Examiner are as follows:

1. Claims 34 and 35 are rejected under 35 U.S.C. § 112, ¶ 1, as failing to comply with the written description requirement.
2. Claims 15 to 23 and 25 to 35 are rejected under 35 U.S.C. § 102(e) as being anticipated by Yasuda.
3. Claim 24 is rejected under 35 U.S.C § 103(a) as unpatentable over. Yasuda.

The Examiner contends that the Appellants' disclosure does not disclose a transfer case wherein the second axle output shaft is only coupled to the first axle during a wheel slippage condition.

The Appellants contend that their Specification discloses that the coupling of the second axle output shaft to the first axle output shaft occurs only during a wheel slippage condition.

The Examiner contends that Yasuda discloses each and every element of claims 15 to 23 and 25 to 35.

The Appellants contend that Yasuda does not disclose a controller that compares the rotational speeds of the first and second axle output shafts to each other and generates a control signal to bring the rotational speeds of the

first and second axle output shafts within a common rotational speed range if the rotational speeds of the first and second axle output shafts differ from each other by a predetermined amount. The Appellants further contend that Yasuda does not disclose that the controller activates the clutch mechanism to couple the first and second axle output shafts during wheel slippage when the rotational speeds are within the common rotational speed range.

ISSUES

The first issue in the case is whether the Appellants have shown that the Examiner erred in determining that Appellants' Specification does not disclose coupling the first and second axle output shafts together only during a wheel slippage condition.

The second issue is whether Yasuda discloses a controller that first determines whether there is wheel slippage and if there is wheel slippage, generates a control signal to bring the rotational speeds of a first axle output shaft and a second axle output shaft within a common rotational speed range and engages the second axle output shaft when the rotational speeds are within the common rotational speed range.

FINDINGS OF FACT

Appellants invented an automatic axle traction control system. The specification teaches that in prior art devices, automatic controlled engagement and disengagement of the front axle is initiated independent of ground conditions. Therefore, the engagement of the front axle may be poorly timed to maintain the vehicle tractive effort and may lead to unnecessary engagement of the front axle resulting in additional wear of the

components. Further, poorly timed engagement of the front axle can damage the transfer case and axle components resulting in vehicle downtime and increased costs for replacement of components (Specification 1).

Therefore, the Appellants' invention takes into consideration both the relative rotational speeds of the front and rear axle output shafts and the ground conditions (Specification 1). In this regard, the Appellants' system includes a controller that first determines whether there is wheel slippage and then determines whether the rotational speeds of the front axle output shaft 54 and rear axle output shaft 52 are within a predetermined speed range and only then engages the front wheel axle shaft 54. If the rotational speeds of the front axle output shaft 54 and rear axle shaft 52 are not within the predetermined speed range, the controller controls the engine output torque or the wheel brake torque to bring the front axle output shaft 54 and the rear axle output shaft 52 within the predetermined speed range. Once the front axle output shaft 54 and the rear axle output shaft 52 are within the predetermined speed range, the controller engages the front axle output shaft 54 (Specification 7).

When there is no longer wheel slippage, the transfer case declutch mechanism disengages the front axle shaft (Specification 6). Appellants recognize that it may be difficult to determine when ground conditions have improved sufficiently but suggest various measures to solve this potential problem i.e., the transfer case could include a spring disengagement mechanism or a time delay device (Specification 6-7). In any case, once it is determined that there is no wheel slippage, by whatever method, the front axle shaft is disengaged.

Yasuda discloses a device to engage a front wheel shaft when wheel slippage is determined (Yasuda, col. 3, lines 6-10). Wheel slippage is determined by calculating a slippage ratio S using the equation: S=(VTFR+ VTFL-VTRR–VTRL)/2, where VTFR is the front right wheel speed, VTFL is the front left wheel speed, VTRR is the rear right wheel speed and VTRL is the rear right wheel speed (Yasuda, col. 3, ll. 56-64). If the slippage ratio S is above a threshold value, STH, it is determined that there is wheel slippage, and the front axle is engaged (Yasuda, col. 3, ll. 28-33; col. 4, ll. 19-27).

Yasuda does not include a controller that first determines whether there is wheel slippage and if there is wheel slippage, generates a control signal to bring the rotational speeds of a first axle output shaft and a second axle output shaft within a common rotational speed range and engages the second axle output shaft when the rotational speeds are within the common rotational speed range.

ANALYSIS

In regard to issue one, it is our determination that Appellants' Specification discloses that the front axle is engaged only during wheel slippage. While it is true that Appellants' Specification discloses that it may be difficult to determine when wheel slippage ends, the Specification nonetheless discloses that once it is determined, by whatever method, that there is no wheel slippage, the front axle is disengaged. As such, in our view, the subject matter recited in claims 34 and 35 is disclosed in the Specification in a manner which complies with the first paragraph of 35 U.S.C. § 112.

In regard to the second issue, the subject matter of independent claims 15 and 26 is not disclosed in Yasuda because Yasuda does not disclose the controller and its functions as recited in claim 15, or the generating step recited in claim 26. *Claims 16 to 23, 25, and 35 depend from claim 15 and claims 27 to 34* depend from claim 26 and thus include the subject matter of independent claims 15 and 26 respectively.

Further, the subject matter of claim 24, which is dependent on claim 15, is not suggested by Yasuda because Yasuda does not suggest the controller and its functions as recited in claim 15.

CONCLUSION/ORDER

The Examiner's rejection of claims 34 and 35 under the first paragraph of 35 U.S.C. § 112, is not sustained.

The Examiner's rejection of claims 15 to 23 and 25 to 35 under 35 U.S.C. § 102(e) is not sustained.

The Examiner's rejection of claim 24 under 35 U.S.C. § 103(a) is not sustained.

The decision of the Examiner is *reversed*.

REVERSED

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CARLSON, GASKEY & OLDS, P.C.
400 WEST MAPLE ROAD
SUITE 350
BIRMINGHAM, MI 48009