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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte YOSUKE KOSAKA and KOICHIRO SHINOZAKI

Appeal 2018-006510
Application 13/928,929
Technology Center 3700

Before PHILIP J. HOFFMANN, KENNETH G. SCHOPFER, and
AMEE A. SHAH, *Administrative Patent Judges*.

SHAH, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's final decision to reject claims 1–8, which are all of the claims pending in this application. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

¹ We use the word Appellant to refer to “applicant” as defined in 37 C.F.R. § 1.42(a). Appellant identifies the real party in interest as Honda Motor Co., Ltd. Appeal Br. 3.

CLAIMED SUBJECT MATTER

The claims relate “to an internal EGR [exhaust gas recirculation] amount calculation device for an internal combustion engine, for calculating an internal EGR amount of the engine.” Spec. 1. Claim 1, reproduced below, is the only independent claim and is representative of the claimed subject matter:

1. An internal EGR amount calculation device for an internal combustion engine, which changes an internal EGR amount, which is an amount of burned gases remaining in a cylinder, by changing valve timing of at least one of an intake valve and an exhaust valve, comprising:

valve timing-obtaining means for obtaining the valve timing;

reference in-cylinder gas amount-calculating means for calculating a reference in-cylinder gas amount, which is an amount of burned gases remaining in the cylinder when the valve timing is set to a predetermined reference timing;

inflow/outflow gas change amount-calculating means for calculating an amount of change in an amount of burned gases flowing into or out of the cylinder during valve-opening time periods of the intake valve and the exhaust valve, with respect to an amount of burned gases flowing into or out of the cylinder when the valve timing is set to the predetermined reference timing, as an inflow/outflow gas change amount, according to the valve timing; and

internal EGR amount-calculating means for calculating the internal EGR amount based on the reference in-cylinder gas amount and the inflow/outflow gas change amount,

wherein the internal EGR amount is used to change the valve timing of at least one of the intake valve and exhaust valve.

Appeal Br. 23 (App’x 1).

REFERENCE

The prior art relied upon by the Examiner is:

Name	Reference	Date
Koseki et al. (“Koseki”)	US 2004/0139949 A1	July 22, 2004

REJECTIONS

Claims 1–8 stand rejected under pre-AIA 35 U.S.C. § 102(b) as being anticipated by Koseki. Final Act. 8, 11.

Claims 2, 4, 6, and 8 stand rejected, alternatively, under pre-AIA 35 U.S.C. § 103(a) as obvious over Koseki. *Id.* at 11.

OPINION

Anticipation

We agree with Appellant’s contention that the Examiner has not adequately shown that Koseki discloses calculating an amount of burned gases flowing into or out of the cylinder, as recited in independent claim 1. *See* Appeal Br. 10–11.

Koseki discloses, in relevant part, calculation sections that calculate: (1) an exhaust valve closure timing in-cylinder residual gas amount (“EVC in-cylinder gas amount”) MRESCYL; (2) a valve overlap period blow-back gas amount (“O/L period blow-back amount”) MRESOL; and (3) an internal exhaust gas recirculation (“EGR”) amount per cylinder MRES based on the calculated MRESCYL and MRESOL. Koseki ¶ 59. The EVC in-cylinder gas amount MRESCYL “correspond[s] to the amount of burned gas remaining in the engine cylinder at the exhaust valve closure timing EVC.” *Id.* “O/L period blow-back gas amount MRESOL means a quantity of gas

flow from one of intake and exhaust ports **5p** and **6p** via combustion chamber **3** to the other port during a valve overlap period during which both of the intake and exhaust valves are open together.” *Id.* In other words, “O/L period blow-back gas amount MRESOL corresponds to the quantity of gas flow between intake and exhaust ports **5p** and **6p** via combustion chamber **3** during a valve overlap period, the gas flow being created by the pressure difference between the intake and exhaust ports **5p** and **6p**.” *Id.* After a series of calculations of EVC in-cylinder gas amount MRESCYL and O/L period blow-back amount MRESOL, the internal EGR amount per cylinder MRES “is arithmetically calculated by adding O/L period blow-back gas amount MRESOL to EVC in-cylinder residual gas amount MRESCYL.” *Id.*

The Examiner appears to find, in relevant part, that Koseki’s calculation of blow back gas equates to the claimed calculation of the “amount of change in an amount of burned gases flowing into or out of the cylinder during valve-opening time periods of the intake valve and the exhaust valve,” as recited in claim 1. *See* Final Act. 8 (citing Koseki ¶¶ 52, 59, 61); Ans. 6. Specifically, the Examiner finds

Burned gas in this application and the reference is gas that has gone through the combustion process in the cylinder which is usually then exhausted out of the cylinder. In this process a combustion takes place driving down a piston, then the exhaust valves open and the piston begins to move upwards to exhaust the gas through the exhaust port creating positive pressure in the exhaust system. Then, to achieve “blow-back gas” the intake valve is opened before the exhaust valve is closed creating a valve overlap period where the negative pressure (vacuum) in the intake system pulls air from the exhaust system back into the cylinder and out the intake port until such time as the exhaust valve is closed. All of the air moving into and out of the cylinder

during this process is burned gas which the reference calls “blow-back gas” and is calculated satisfying this limitation.

Ans. at 5–6 (citing Koseki ¶ 59, Fig, 9).

We agree with the Examiner that Koseki’s O/L period blow-back gas amount MRESOL discloses calculating an amount of burned gases flowing into or out of the cylinder during valve-opening time periods of the intake valve and the exhaust valve. However, the Examiner does not adequately show, and we do not see, where or how Koseki’s calculation of a period blow-back gas amount discloses calculating a *change* in the amount of its blow-back gas. *See* Appeal Br. 11.

Accordingly, based on the record before us — because an anticipation rejection requires a finding in a single reference of each and every limitation as set forth in the claims — we do not sustain the rejection of independent claim 1 and dependent claims 2–8 under 35 U.S.C. § 102(b) as anticipated by Koseki.

Obviousness

For the alternate rejection under 35 U.S.C. § 103(a) of claims 2, 4, 6, and 8, which ultimately depend from independent claim 1, the Examiner’s relies on the same inadequately supported finding of claim 1. *See* Final Act. 11. Thus, for the same reasons as for claim 1, we also do not sustain the obviousness rejection of dependent claims 2, 4, 6, and 8.

CONCLUSION

The Examiner’s decision to reject claims 1–8 is not sustained. More specifically, the Examiner’s rejections of claims 1–8 under pre-AIA

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35 U.S.C. § 102(b), and of claims 2, 4, 6, and 8 under 35 U.S.C. § 103(a) are REVERSED.

DECISION SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	Basis	Affirmed	Reversed
1-8	102(b)	Anticipated by Koseki		1-8
2, 4, 6, 8	103(a)	Obvious over Koseki		2, 4, 6, 8
Overall Outcome				1-8

REVERSED