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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ROSS DYKSTRA PURSIFULL, ROBERT ROY JENTZ,
and JOHN ERIC ROLLINGER

Appeal 2017-009952¹
Application 13/620,021²
Technology Center 3700

Before BRADLEY B. BAYAT, FREDERICK C. LANEY, and
PAUL J. KORNICZKY, *Administrative Patent Judges*.

BAYAT, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner’s decision rejecting claims 1–4, 6–11, 13, 15–18, and 20–22, which are the only claims pending in the Application. We have jurisdiction under 35 U.S.C. § 6(b). An oral hearing was held on September 12, 2019.

We AFFIRM-IN-PART.

¹ Our Decision references Appellants’ Appeal Brief (“Appeal Br.,” filed Feb. 13, 2017), Reply Brief (“Reply Br.,” filed July 17, 2017), the Examiner’s Answer (“Ans.,” mailed June 14, 2017), and Final Office Action (“Final Act.,” mailed July 12, 2016).

² Appellants identify “Ford Global Technologies, LLC” as the real party in interest. Appeal Br. 4.

STATEMENT OF THE CASE

Claimed Subject Matter

Appellants' claimed invention is directed to "CRANKCASE INTEGRITY BREACH DETECTION." Spec., Title. Independent claim 16, reproduced below, is illustrative of the subject matter on appeal.

16. An engine crankcase ventilation system of a vehicle, comprising:
 - an engine including an intake passage and a crankcase;
 - a crankcase vent tube having an inlet mechanically connected to the intake passage upstream of a compressor and an outlet mechanically connected to the crankcase via an oil separator, the crankcase vent tube located external to the engine;
 - a PCV valve coupled between the crankcase and an engine intake manifold at a location downstream of an intake throttle;
 - a flow sensor coupled in the crankcase vent tube for estimating air flow through the crankcase vent tube; and
 - a control system with computer readable instructions stored in read-only memory for,
 - during engine cranking,
 - decreasing an opening of a PCV valve to a low flow position, and
 - estimating a change in air flow through the crankcase vent tube;
 - during engine running after engine cranking,
 - monitoring a change in steady-state crankcase vent tube pressure relative to a change in steady-state manifold air flow; and
 - differentiating between disconnection of a crankcase vent tube from degradation of the PCV valve based on characteristics of a transient dip in crankcase vent tube pressure; and
 - setting different diagnostic codes based on whether the crankcase vent tube is disconnected or the PCV valve is degraded.

Appeal Br. 39–40, Claims App.

Rejections

Claim 7 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite.

Claims 1–4 and 21 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Pursifull et al., (US 2010/0147270 A1, published June 17, 2010) (hereinafter Pursifull), Carlson et al., (US 2,516,547, issued July 25, 1950) (hereinafter Carlson), Moren, (US 2001/0022175 A1, published Sept. 20, 2001), Miwa et al., (US 7,726,270 B2, issued June 1, 2010) (hereinafter Miwa), and Hewelt et al., (US 5,792,949, issued Aug. 11, 1998) (hereinafter Hewelt).

Claim 6 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Pursifull, Carlson, Moren, Miwa, Hewelt, and Niessen et al., (US 7,229,381 B2, issued June 12, 2007) (hereinafter Niessen).

Claim 7 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Pursifull, Carlson, Moren, Miwa, Hewelt, and Niessen, and Baeuerle et al., (US 6,779,388 B2, issued Aug. 24, 2004) (hereinafter Baeuerle).

Claim 8 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Pursifull, Carlson, Moren, Miwa, Hewelt, and Schneider et al., (US 6,575,022 B1, issued June 10, 2003) (hereinafter Schneider).

Claims 9–11 and 15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Pursifull, Carlson, Moren, Schneider, and Monros, (US 2010/0180872 A1, published July 22, 2010).

Claim 13 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Pursifull, Carlson, Moren, Monros, and O’Daniel, (US 5,897,597, issued Apr. 27, 1999).

Claims 16, 18, 20, and 22 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Pursifull, Carlson, Moren, Miwa, Schneider, Hewelt, and Beyer et al., (US 7,080,547 B2, issued July 25, 2006) (hereinafter Beyer).

Claim 17 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Pursifull, Carlson, Moren, Miwa, Schneider, Hewelt, Beyer, and Monros.

ANALYSIS

35 U.S.C. § 112, second paragraph

The Examiner rejected claim 7 as indefinite because there is insufficient antecedent basis for the recitation “the indicating” in line 1. Final Act. 5. In response, “Appellant agrees with the Office and will address the antecedent basis correction in claim 7 after appeal as the Office’s interpretation of claim 7 conforms with Appellant’s intent.” Appeal Br. 10.

Accordingly, we summarily sustain the rejection of claim 7 as indefinite.

35 U.S.C. § 103(a)

For a number of reasons, we are persuaded that the combination of prior art references, as proposed by the Examiner, does not render obvious the claimed invention.

In rejecting independent claim 16 as unpatentable over Pursifull, Carlson, Moren, Miwa, Schnedier, Hewelt, and Beyer, the Examiner found Pursifull discloses “a PCV valve coupled between the crankcase and an engine intake manifold at a location downstream of an intake throttle” (Final Act. 21), but Pursifull does not disclose “decreasing an opening of the PCV

valve to a low flow position” during engine cranking. *Id.* at 21. To cure this deficiency, the Examiner found “Carlson discloses reducing an opening of a crankcase vent tube [through valve 30 and restricted by-pass 40] during engine cranking” (Ans. 25), and determined that “it would have been obvious to a person having ordinary skill in the art at the time the invention was made to simply substitute the valve disclosed by Pursifull with the PCV valve disclosed by Carlson.” Final Act. 22. The Examiner found “Pursifull and Carlson do not disclose an arrangement wherein a vent tube outlet is mechanically connected to the crankcase” as required by claim 16 (*id.*), and relied on Moren “to modify the crankcase ventilation system disclosed by Pursifull with the arrangement of crankcase vent tubes disclosed by Moren.” *Id.* at 23. Further, the Examiner found that “Pursifull, as modified by Carlson and Moren, does not explicitly disclose indicating degradation of the valve based on deviations of an estimated crankcase vent tube air flow profile” and instead relied on Schneider to cure this deficiency. *Id.* at 23. Even further, the Examiner found the combination of Pursifull, Carlson, Moren, and Schneider fails to disclose

during engine running after engine cranking,
monitoring a change in steady-state
crankcase vent tube pressure relative to a change in
steady-state manifold air flow; and
differentiating disconnection of a crankcase vent
tube from degradation of the PCV valve and further
based on . . . characteristics of a transient dip in
crankcase vent tube pressure; and
setting different diagnostic codes based on whether
the crankcase vent tube is disconnected or the PCV valve
is degraded

(*id.* at 23–24), and relied on Hewett, Miwa, and Beyer to additionally modify the modified Pursifull system to arrive at the claimed invention. *Id.* at 24–25.

We are not persuaded that a skilled artisan would have been motivated to substitute Pursifull’s PCV valve for Carlson’s plug valve 30 as a simple substitution of known art-recognized components with predictable results. Pursifull discloses “an electronically actuable, normally open valve operatively coupled to controller 46[, which is] configured to open the PCV/bypass valve during engine cranking.” Pursifull ¶ 32. Under these conditions, Pursifull teaches that “crankcase 12, if unbreeched, will develop a vacuum,” whereas, the failure to develop a vacuum indicates a breach of the crankcase. *Id.* In other words, Pursifull’s breach detection mechanism functions by opening the PCV-bypass valve during engine cranking to assess an expected positive pressure. In contrast, “Carlson discloses reducing an opening of a crankcase vent tube [through valve 30 and restricted by-pass 40] during engine cranking” (Ans. 25), which the Examiner equates to “decreasing an opening of the PCV valve to a lowflow position,” as recited in claim 16. Final Act. 21. Thus, Pursifull’s breach detection functions by opening the PCV-bypass valve, while Carlson’s crankcase ventaltor functions by reducing the opening during engine cranking.

The fact that these structures increase or decrease the opening of a valve does not necessarily support a finding that one of ordinary skill in the art could have substituted these different structures for one another as a simple substitution, as the Examiner proposes. To rely on simple substitution as a rationale supporting an obviousness rejection, the prior art must support a finding to substitute one known element for another, and the

results of the substitution and functions of the combination would have been predictable. *See* MPEP § 2143(I)(B). Despite the similarity between the structures in Pursifull and Carlson, the Examiner has not established that one of ordinary skill would have been motivated to substitute one component for another because each of these elements were known in the art to perform a different function. To rely on equivalence as a rationale supporting an obviousness rejection, the prior art must recognize the equivalency. The mere fact that the components at issue are functional or mechanical equivalents is not enough. MPEP § 2144.06 II.

We agree with Appellants that opening and reducing an opening are opposite actions and “modifying Pursifull with Carlson requires that Pursifull be modified to the exact opposite valve control than what it discloses in terms of diagnostics of the PCV system based on the sensed crankcase pressure.” Reply Br. 3. The Examiner has not adequately shown and “there is insufficient evidence based on Carlson that a negative pressure or vacuum would be allowed to develop and a crankcase breach detected if Pursifull were modified to include the valve of Carlson.” *Id.* at 4. In fact, based on Carlson’s teachings, the substitution as proposed by the Examiner “would lead to the reduction of effective suction during cranking, not the development of vacuum.” *Id.*

In addition, we find the Examiner’s reliance on Moren, Miwa, Schnedier, Hewelt, and Beyer, which would require further modifications to the Pursifull/Carlson system, ostensibly negates the Examiner’s simple substitution rationale because those additional modifications would necessarily require more than a simple substitution of one known element for another to obtain predictable results. As such, we agree with Appellants

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that the Examiner “relies on much more than a simple valve substitution.”
Appeal Br. 14. Such modifications do not involve a simple substitution of one part for another equivalent part; instead, they involve hindsight reconstruction.

Accordingly, we do not sustain the rejection of independent claim 16, and its dependent claims. For the same reasons, we also do not sustain the rejection of independent claims 1 and 9, and their dependent claims, which are rejected based on the same flawed reasoning as claim 16. *See* Final Act. 5–10, 13–18.

DECISION

The rejection under 35 U.S.C. § 112, second paragraph, is affirmed.

The rejections under 35 U.S.C. § 103(a) are reversed.

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

AFFIRMED-IN-PART