

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte JAN HODGSON, ROLF BRUCK,
and MEIKE REIZIG

Appeal 2008-1074
Application 10/281,003
Technology Center 1700

Decided: May 5, 2008

Before BRADLEY R. GARRIS, CHUNG K. PAK, and
PETER F. KRATZ, *Administrative Patent Judges*.

PAK, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on an appeal under 35 U.S.C. § 134 from the Examiner's final rejection of claims 1 through 6, all of the claims pending in the above-identified application. We have jurisdiction pursuant to 35 U.S.C. § 6.

We AFFIRM.

STATEMENT OF THE CASE

The subject matter on appeal is directed to removing undesirable carbon particles from the exhaust gas of an internal combustion engine via a collecting element. Spec. 1. The collecting element causes the exhaust gas to swirl so that the carbon particles in the exhaust gas react with nitrogen dioxide to form nitric oxide and carbon dioxide. Spec. 1-3. Further details of the appealed subject matter are recited in representative claim 1, which states the following:

1. A method for removing soot particles from an exhaust gas of an internal combustion engine, which comprises:

providing a collecting element for freely conducting the exhaust gas, the collecting element having flow paths, a multiplicity of at least one of deflections and swirl-inducing and calming zones, and at least one of openings and apertures for ensuring the mixing of flows in adjacent flow paths;

feeding the exhaust gas through the collecting element; and

at least one of retaining at least some of the particles and swirling around at least some of the particles long enough to ensure an adequate probability of a reaction with nitrogen dioxide present in the exhaust gas until substantially eliminating the particles.

As evidence of unpatentability of the claimed subject matter, the Examiner has relied upon the following references:

Cooper	4,902,487	Feb. 27, 1987
Maus '403	5,045,403	Sep. 3, 1991
Peter-Hoblyn '655	WO 95/02655	Jan. 26, 1995
Peter-Hoblyn '475	5,976,475	Nov. 2, 1999
Maus '021	6,534,021 B1	Mar. 18, 2003

The Examiner has rejected the claims on appeal as follows:

- 1) Claims 1, 2, 5, and 6 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Maus '021, Maus '403, and Cooper; and
- 2) Claims 3 and 4 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Maus '021, Maus '403, Cooper, and either Peter-Hoblyn '475 or Peter-Hoblyn '655.

The Appellants appeal from the Examiner's decision rejecting the claims on appeal under 35 U.S.C. § 103(a).

PRINCIPLES OF LAW, RELEVANT FACTUAL FINDINGS, ISSUES, AND ANALYSES

Under 35 U.S.C. § 103, the factual inquiry into obviousness requires a determination of: (1) the scope and content of the prior art; (2) the differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). “[A]nalysis [of whether the subject matter of a claim would have been obvious] 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 Intl. Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1741 (2007).

Rejection of Claims 1, 2, 5, and 6¹

Appellants do not dispute the Examiner's findings and determination in page 3 of the Answer regarding Maus '021 and Cooper, which states:

Maus '021 discloses a method for removing soot particles from exhaust gas of an internal combustion engine, comprising: providing a collecting element (1) for freely conducting the diesel exhaust gas, the collecting element (1) having multiplicity of corrugated channel[s] (5) [corresponding to the claimed flow paths] with a plurality of deflections and swirling-inducing and calming zones (6, 7, 8); feeding the exhaust gas through the collecting element; and retaining the particles and then eliminating the collected particles through thermally, mechanically or chemically (see, for example, abstract; col. 4, lines 32-35; col. 6, lines 28-55; col. 9, lines [sic] col. 10, lines 21-35, etc.). . . Cooper et al discloses [sic] the conventionality of reacting the particles with nitrogen dioxide present in the exhaust gas for regenerating the collecting element. It would have been obvious to one having ordinary skill in the art to select an appropriate method to eliminate the collected particles, such as reacting the particles with nitrogen dioxide as taught by Cooper et al in the apparatus of Maus '021.

Appellants only contend that there is no reason to provide openings through the corrugated channel flow guide surfaces taught by Maus '021. *Id.*

Thus, the dispositive question is whether one having ordinary skill in the art would have been led to form holes through the flow guide surfaces of Maus '021 in order to ensure the mixing of the exhaust gas in the flow paths

¹ Appellants do not separately argue with reasonable specificity the individual claims rejected under 35 U.S.C. § 103(a) over the combined disclosures of Maus '021, Maus '403, and Cooper (App. Br. 6-13 and Reply Br. 2-6). Therefore, we select independent claim 1 to decide this issue on appeal regarding claims 1, 2, 5, and 6 consistent with 37 C.F.R. § 41.37(c)(1)(vii) (2005).

adjacent to the corrugated channel flow guide surfaces within the meaning of 35 U.S.C. § 103(a). On this record, we answer this question in the affirmative.

Although Maus '021 teaches (col. 9, l. 66-col. 10, l. 20) a filter having gas impermeable flow guide surfaces as one of its embodiments, it also teaches a different flow arrangement configured to provide a different mixing effect to facilitate either a thermal or catalytic treatment. Specifically, we find that Maus '021 teaches (col. 10, ll. 20-25) that the gas impermeable flow guide surfaces can have openings in order to provide a "further mixing effect." We find that Maus '021 explains (col. 10, ll. 25-40) that the unfiltered gas flows through the openings from the first filter stage 6 to the second filter stage 7 in order to provide a "step-wise" retention of the carbon particles. Thus, we determine that Maus '021 itself would have at least suggested forming openings in the flow guide surfaces in order to ensure the mixing of flows in adjacent flow paths as required by claim 1.

Even if we were to find that Maus '021 alone would not have suggested such openings, which we do not, the outcome of this case would not be altered. We find that Maus '403 also teaches (col. 4, ll. 30-40 and col. 6, ll. 21-36) that the openings through the metal sheet layer 10, which serve as a flow guide surface in multiple flow paths for carbon particles, promote transverse mixing between the various flow paths. Maus '403 explains (col. 1, ll. 20-31) that such openings promote catalytic activity by further diffusing the gas flow.

Under these circumstances, we concur with the Examiner that one having ordinary skill in the art would have been led to provide openings

through the flow guide surfaces of Maus '021 in order to mix the gas flow path with an adjacent gas flow path, with the reasonable expectation of successfully removing undesirable carbon particles and improving the catalytic treatment of the gas flow.

Accordingly, based on the factual findings set forth in the Answer and above, we affirm the Examiner's decision rejecting claims 1, 2, 5, and 6 under 35 U.S.C. § 103(a).

Rejection of Claims 3 and 4²

The Examiner has determined that the prior art references applied would have rendered the subject matter defined by claim 3 obvious to one of ordinary skill in the art. The Appellants do not challenge the Examiner's findings and conclusions directed to the additional features recited in this claim. (App. Br. 6-13 and Reply Br. 2-6). Instead, Appellants restate the arguments advanced in connection with the 35 U.S.C. § 103(a) rejection of independent claim 1 discussed above. *Id.* Accordingly, for the reasons set forth above and at pages 3 through 5 of the Answer, we affirm the Examiner's decision to reject claims 3 and 4 under 35 U.S.C. § 103(a)

² Appellants do not separately argue with reasonable specificity the individual claims rejected under 35 U.S.C. § 103(a) over the combined disclosures of Maus '021, Maus '403, Cooper, and either Peter-Hoblyn '475 or Peter-Hoblyn '655 (App. Br. 6-13 and Reply Br. 2-6). Therefore, we select claim 3 to decide this issue on appeal regarding claims 3 and 4 consistent with 37 C.F.R. § 41.37(c)(1)(vii) (2005).

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ORDER

The decision of the Examiner is affirmed.

TIME PERIOD

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

AFFIRMED

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