

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 JOHN ELTER, RICHARD H. GAYLORD, III,
QUNHUI GUO, CHOICKALINGAM KARUPPAIAH,
HAO TANG and YAOBANG WU

Appeal 2006-2522
Application 10/279,632
Technology Center 1700

Decided: October 11, 2006

Before KIMLIN, PAK, and GAUDETTE, *Administrative Patent Judges*.

KIMLIN, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 1-17. Claim 1 is illustrative:

1. A fuel cell, comprising:
 - a first flow plate;
 - a second flow plate;
 - an electrolyte layer between the first and second flow plates; and

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a cathode between the first flow plate and the electrolyte layer, wherein the cathode comprises:

- an electrolytic polymer;
- a non-electrolytic polymer;
- a first catalyst; and
- a second catalyst different from the first catalyst.

The Examiner relies upon the following references as evidence of obviousness:

Chun	US 2001/0052389 A1	Dec. 20, 2001
Isono	US 6,365,293 B1	Apr. 2, 2002
Surampudi	US 6,420,059 B1	Jul. 16, 2002
Hampden-Smith	US 2002/0107140 A1	Aug. 8, 2002
Mazzucchelli	US 6,737,183 B1	May 18, 2004
Castro	US 2005/0106450 A1	May 19, 2005

Appellants' claimed invention is directed to a fuel cell comprising first and second flow plates and an electrolyte layer between the flow plates. The cell also comprises a cathode between a first flow plate and the electrolyte layer, which cathode comprises electrolytic and non-electrolytic polymers, as well as first and second catalysts that are different from each other.

Appealed claims 1-13, 15, and 16 stand rejected under 35 U.S.C. § 103 as being unpatentable over Chun in view of Surampudi. Claims 1-17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Isono in view of Surampudi.

Appellants do not separately argue claims 2-13, 15, and 16, which are dependent upon claim 1. Accordingly, claims 2-13, 15, and 16 stand or fall together with claim 1 (*see* Br. 4, second paragraph).

We have thoroughly reviewed each of Appellants' arguments for patentability. However, we are in complete agreement with the Examiner that the claimed subject matter would have been obvious to one of ordinary skill in the art within the meaning of § 103 in view of the applied prior art. Accordingly, we will sustain the Examiner's rejections for the reasons set forth in the Answer, which we incorporate herein, and we add the following for emphasis only.

There is no dispute that the two primary references, Chun and Isono, both disclose a fuel cell having the presently claimed first and second flow plates, an electrolyte layer between the plates, and a cathode between the first plate and the electrolyte layer wherein the cathode comprises electrolytic and non-electrolytic polymers and a catalyst. As recognized by the Examiner, neither of the primary references discloses a combination of different catalysts on the cathode. However, as explained by the Examiner, Surampudi discloses that the cathode of a fuel cell may comprise different platinum catalysts, i.e., supported and non-supported platinum catalysts. Although Surampudi does not explicitly teach that the different catalysts may be combined together on the cathode, the Examiner has properly cited the relevant case law for the proposition that it is a matter of obviousness for one of ordinary skill in the art to combine two or more materials when each

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is taught by the prior art to be useful for the same purpose. *In re Kerkhoven*, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980). Consequently, we are in full agreement with the Examiner’s legal conclusion that it would have been obvious for one of ordinary skill in the art to use a combination of different platinum catalysts for the cathodes of Chun and Isono with the reasonable expectation that the resultant cathode would perform effectively in the fuel cells. Indeed, as pointed out by the Examiner, Surampudi expressly teaches that “[t]he cathode catalyst ink is preferably pure platinum, although other inks can be used and other materials can be mixed into the ink as described herein” (col. 12, ll. 47-51, emphasis added). Significantly, Appellants advance no argument based on unexpected results attributed to the broadly-claimed combination of different catalysts. In the absence of such evidence, the Examiner’s prima case of obviousness stands unrebutted.

Appellants contend that “one skilled in the art would not be motivated to modify a particular cathode design by adding additional elements, such as another catalyst, because doing so could complicate the manufacture of the cathode and/or increase the cost associated with manufacturing the cathode” (Br. 3, second paragraph, last sentence). However, even though the cost of using different catalysts may be greater than using only one, the scarcity or unavailability of one may compel the use of more than one catalyst. Moreover, Appellants have not established that their use of different catalysts does not, unexpectedly, complicate the manufacture of the cathode or increase the cost.

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Appellants separately argue claims 4 and 7 which recite ranges for the amount of one of the catalysts and the second catalyst, respectively.

However, we agree with the Examiner that it would have been a matter of *prima facie* obviousness for one of ordinary skill in the art to determine the optimum amount for each catalyst. *In re Boesch*, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980). Also, Appellants have not refuted the Examiner's factual finding that "it is well known in the art that the efficiency of oxidant reduction in the cathode is determined by the amounts of platinum black (carbon supported platinum) in the electrode. See Mazzucchelli et al. (U.S. 7[^{sic}6],737,183 B1); Column 1, Lines 48-67" (Answer 7, third paragraph).

In conclusion, based on the foregoing and the reasons well-stated by the Examiner, the Examiner's decision rejecting the appealed claims is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1)(iv) (2004).

AFFIRMED

clj

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