THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 23

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte KENNETH W. BEEBE

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Appeal No. 99-0209
Application No. 08/643,048[1]

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ON BRIEF

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Before McCANDLISH, *Senior Administrative Patent Judge,* ABRAMS and FRANKFORT, *Administrative Patent Judges*.

ABRAMS, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal from the decision of the examiner finally rejecting claims 1-5, 7-13, 15 and 16, which at that point constituted all of the claims remaining of record in the application. Amendments permitted entry after the final

[1] Application for patent filed May 2, 1996.

rejection resulted in the cancellation of claims 7 and 15 and the addition of claim 20, as well as changes to claims 1, 4, 5, 9, 12 and 13. Notwithstanding the amendments, the examiner maintained a rejection of all of the surviving claims. Therefore, before us on appeal are claims 1-5, 8-13, 16 and 20.

The appellant's invention is directed to a premixing low NOx fuel emissions combustor with lean direct injection (LDI) of gas fuel. The claims on appeal have been reproduced in an appendix to the Appeal Brief.

THE REFERENCES

The references relied upon by the examiner to support the final rejection are:

Bayer	2,944,388	Jul. 12, 1960
Amos	5,394,688	Mar. 7, 1995

THE REJECTION

Claims 1-5, 8-13, 16 and 20 stand rejected under 35 U.S.C.

§ 103 as being unpatentable over Amos in view of Bayer.[2]

The rejection is explained in the Examiner's Answer.

OPINION

Rather than reiterate the opposing viewpoints of the examiner and the appellant, we refer to the Examiner's Answer (Paper No. 17) and the appellant's Briefs (Papers Nos. 16 and 19) for a full explanation thereof.

The test for obviousness is what the combined teachings of the prior art would have suggested to one of ordinary skill in the art. See, for example, ***In re Keller***, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981). In establishing a *prima facie* case of obviousness, it is incumbent upon the examiner to provide a reason why one of ordinary skill in the art would have been led to modify a prior art reference or to combine

[2] Although not so designated, technically, this is a new rejection made for the first time in the Examiner's Answer, in that it is applied for the first time against a number of the claims. In the final rejection, the examiner rejected claims 1-4, 8-12 and 16 under 35 U.S.C. § 102(b) as being anticipated by Amos, and claims 5, 7, 13 and 15 under 35 U.S.C. § 103 as being unpatentable over Amos in view of Bayer. The Section 102 rejection has been withdrawn, and the appellant has responded to the new Section 103 rejection in the Reply Brief.

reference teachings to arrive at the claimed invention. See ***Ex parte Clapp***, 227 USPQ 972, 973 (Bd. Pat. App. & Int. 1985). To this end, the requisite motivation must stem from some teaching, suggestion or inference in the prior art as a whole or from the knowledge generally available to one of ordinary skill in the art and not from the appellant's disclosure. See, for example, ***Uniroyal, Inc. V. Rudkin-Wiley Corp.***, 837 F.2d 1044, 1052, 5 USPQ2d 1434, 1052 (Fed. Cir.), *cert. denied*, 488 U.S. 825 (1988).

The dispositive issue in this case is whether it would have been obvious to one of ordinary skill in the art to modify the Amos gas turbine structure by replacing the disclosed fuel spray pegs (78) located in the secondary air inlet passage (68) with the fuel/air atomizing spray bars (31) disclosed by Bayer in the context of providing fuel to the afterburner of a jet engine. It is our opinion that it would not have been obvious to do so, and therefore we will not sustain the examiner’s rejection. Our reasons for arriving at this conclusion follow.

The problem to which the appellant has directed his inventive efforts is minimizing the level of oxides of nitrogen (NOx) in the reaction zone of a gas turbine engine. Central to the appellant's solution to the problem is injecting fuel and air directly into the secondary combustion zone of the gas turbine by means of a lean direct injection (LDI) assembly. As described on pages 4, 7 and 8 of the specification, each LDI spoke is supplied with fuel and air from separate manifolds, which fuel and air is discharged together from openings in the spokes directly into the secondary combustion zone.

Amos also is concerned with reducing NOx. Like the appellant's claimed invention, Amos utilizes primary and secondary combustion systems. In the Amos system, a first set of gas fuel spray pegs (62) located in air inlets to the primary combustion zone, in conjunction with swirl vanes (84 & 86), supply an efficiently mixed fuel/air stream to the primary zone, where it produces combustion having lower NOx. Pressurized air to the secondary combustion zone is supplied through a plurality of annular passages (68), and gas fuel is added to each of these streams through another set of fuel

spray pegs (76) located upstream of the secondary combustion zone in the secondary air passages. In the Amos system, the gas fuel is mixed with the air after the fuel exits the fuel spray pegs. Essentially, with regard to the system recited in the appellant's claims Amos does not teach providing fuel and air to a secondary combustion zone by means of a plurality of spokes, each of which injects both the fuel and the air.

For this teaching the examiner looks to Bayer, which is directed to a jet engine with an afterburner. Bayer discloses, *inter alia*, a plurality of fuel/air injectors (31) that are very similar in construction to the injectors used in the appellant's invention, in that they include separate connections for fuel supply and air supply, an annular chamber in which fuel and air are received, and a plurality of discharge openings (51) through which fuel and air are injected directly into a combustion chamber. It is the examiner's position that it would have been obvious to one of ordinary skill in the art to replace the secondary combustion zone fuel injectors disclosed by Amos with those of Bayer because "[s]uch a configuration provides maximum fuel

atomization with minimal atomizing air flow," as well as a number of other benefits (Answer, page 5).

We do not agree with this conclusion. The mere fact that the prior art structure could be modified does not make such a modification obvious unless the prior art suggests the desirability of doing so. See ***In re Gordon***, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984). In our view, there are several factors which would have acted as disincentives to one of ordinary skill in the art to make the modification proposed by the examiner. The first is that Amos already has solved the problem of reducing NOx and why, therefore, would the artisan wish to modify that system. Carrying this one step further, Amos achieves the necessary mixing of the separately injected fuel and air streams as they proceed together along the length of the annular passages (68), and to replace the fuel-only injectors with fuel/air injectors would seem to provide no advantage. In addition, Amos utilizes gas fuel while the fuel used in Bayer is liquid and, notwithstanding the examiner's opinion, there is no evidence to support a conclusion that one of ordinary skill in the art

would have considered the Bayer liquid injector to be usable in a gas fuel system.

In view of the above, we fail to perceive any teaching, suggestion or incentive in either of the references which would have motivated one of ordinary skill in the art to modify the Amos system in the manner proposed by the examiner. From our perspective, the only suggestion for doing so resides in the luxury of the hindsight afforded one who first viewed the appellant's disclosure. This, of course, is not a proper basis for a conclusion of obviousness. See ***In re Fritch***, 972 F.2d 1260, 23 USPQ2d 1780 (Fed. Cir. 1992).

It is our opinion that the combined teachings of the two applied references fail to establish a *prima facie* case of obviousness with regard to the subject matter recited in the appellant's claims.

SUMMARY

The rejection is not sustained.

The decision of the examiner is reversed.

REVERSED

HARRISON E. McCANDLISH Senior Administrative Patent Judge	)
NEAL E. ABRAMS Administrative Patent Judge	) BOARD OF PATENT APPEALS AND INTERFERENCES
CHARLES E. FRANKFORT Administrative Patent Judge	)

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