

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 12

UNITED STATES PATENT AND TRADEMARK OFFICE

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Ex parte RODGER R. LESIEUR

Appeal No. 2001-2488
Application No. 09/368,455

ON BRIEF

Before WALTZ, DELMENDO, and JEFFREY T. SMITH, Administrative Patent Judges.

WALTZ, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal from the primary examiner's final rejection of claims 1 through 14, which are the only claims pending in this application. We have jurisdiction pursuant to 35 U.S.C. § 134.

According to appellant, the invention is directed to a hydrocarbon fuel gas steam reformer assemblage which includes adjacent pairs of burner gas passages and process gas and steam passages, where heat transfer from the burner gases to the

Appeal No. 2001-2488
Application No. 09/368,455

process gas stream is gradually modulated by providing a varying heat transfer fin density population in the burner gas passages (Brief, page 2). A copy of illustrative independent claim 1 is attached as an Appendix to this decision.

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

Parker	4,049,051	Sept. 20, 1977
Lesieur	5,733,347	Mar. 31, 1998

The claims on appeal stand rejected under 35 U.S.C. § 103(a) as unpatentable over Lesieur in view of Parker (Answer, page 3). We reverse the examiner's rejection essentially for the reasons stated in the Brief (page 10), Reply Brief (pages 1-2), and those reasons set forth below.

OPINION

The examiner finds that Lesieur discloses a similar reformer assemblage to that recited in claim 1 on appeal, the only difference being that this reference fails to disclose heat transfer fins present in a "population density gradient" with different heat transfer amounts in different sections of the burner passage (Answer, page 3). The examiner finds that Parker discloses an assemblage with heat transfer fins present in a population density gradient from the gas passage inlet to the gas passage outlet with different amounts of heat transfer for

Appeal No. 2001-2488
Application No. 09/368,455

different sections of the gas passage wall (Answer, paragraph bridging pages 3-4). From these findings, the examiner concludes that it would have been obvious to one having ordinary skill in this art to arrange the heat transfer fins in the burner passage of Lesieur in a population density gradient, where the heat transfer fins in different sections of the passage provide different heat transfers to the wall of the passage, as taught by Parker for the advantage of providing an assemblage with improved thermal fatigue life and to eliminate cracking and splitting (Answer, paragraph bridging pages 4-5). We disagree for reasons stated below.

Appellant's argument that must be answered before consideration of the examiner's obviousness analysis is that the references are "non-analogous" (Brief, page 9). Whether a prior art reference is "analogous" is a question of fact. *See In re Clay*, 966 F.2d 656, 658, 23 USPQ2d 1058, 1060 (Fed. Cir. 1992). The determination that a reference is from non-analogous art is two-fold. First we must determine if the reference is within the field of the inventor's endeavor. If the reference is not within the field of the inventor's endeavor, we determine whether the reference is reasonably pertinent to the particular problems with which the inventor was involved. *See In re GPAC Inc.*, 57 F.3d 1573, 1577, 35 USPQ2d 1116, 1120 (Fed. Cir. 1995); *In re Wood*,

Appeal No. 2001-2488
Application No. 09/368,455

599 F.2d 1032, 1036, 202 USPQ 171, 174 (CCPA 1979).

There is no dispute here that Parker is not within the same field of endeavor as the fuel gas reforming of appellant (and Lesieur). See the Brief, page 9, and the Answer, page 7. However, we agree with the examiner that Parker is "reasonably pertinent" to the particular problem with which appellant is involved, namely heat transfer between adjacent walls or passages so that excessive heat does not damage the walls (specification, page 2, ll. 19-25, describing the "over heating problem"; specification, page 4, ll. 19-21, describing an object as providing a "longer useful life due to temperature control of burner gas passage walls"; and specification, page 6, ll. 24-26, describing the prior art problem of high burner gas passage wall temperatures which shorten the useful life of the reformer). As correctly found by the examiner (Answer, page 5), Parker discloses a solution to the problem of high temperature gradients in core areas of counterflow heat exchangers, which problem can cause thermal fatigue cracking and splitting (col. 1, ll. 8-40).

For the foregoing reasons and those stated in the Answer, we determine that Parker is reasonably pertinent to the problem with which appellant is involved and thus is analogous art.

Therefore we proceed and consider the examiner's obviousness analysis. When determining the patentability of a claimed

Appeal No. 2001-2488
Application No. 09/368,455

invention which combines two known elements, "the question is whether there is something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination. [Citations omitted]." *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1462, 221 USPQ 481, 488 (Fed. Cir. 1984). Evidence of a suggestion, teaching or motivation to combine may flow from the references themselves, the knowledge of one of ordinary skill in the art, or from the nature of the problem to be solved. See *Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc.*, 75 F.3d 1568, 1573, 37 USPQ2d 1626, 1630 (Fed. Cir. 1996).

As correctly argued by appellant (Brief, page 10; Reply Brief, pages 1-2), Lesieur fails to disclose or suggest any problem with high temperature gradients. In contrast, Lesieur teaches that his invention "can be operated at lower service temperatures" than the currently available prior art assemblages (col. 1, ll. 57-58; see also col. 4, ll. 20-23). Furthermore, as also correctly argued by appellant (Brief, page 10), Parker fails to identify the gas turbine operating temperatures at which thermal stress, fatigue, cracking and splitting occur.

The examiner reiterates that the motivation for the proposed combination of references can be found in Parker at col. 1, ll. 33-40, where this reference teaches arrangement of the heat

Appeal No. 2001-2488
Application No. 09/368,455

transfer fins to result in an assemblage with improved thermal fatigue life with the elimination of cracking and splitting (Answer, page 8). The examiner takes the additional position that one of ordinary skill in the art "would recognize the *potential* of thermal fatigue in any counter-current heat exchanger, as such fatigue is *inherent* in said counter-current heat exchangers." *Id.*, emphasis added. However, the examiner has not provided any evidentiary support on this record for this additional position. See *In re Lee*, 277 F.3d 1338, 1343, 61 USPQ2d 1430, 1434 (Fed. Cir. 2002) ("This factual question of motivation is material to patentability, and could not be resolved on subjective belief and unknown authority."). Furthermore, the examiner has not explained how it would have been determined that the assemblage of Lesieur had problems with thermal fatigue when Parker fails to disclose or suggest any operating temperatures which would produce thermal fatigue, even in gas turbine assemblages.

For the foregoing reasons, we determine that the examiner has not established a convincing reason or motivation to combine the references as proposed. Accordingly, we determine that *prima facie* obviousness has not been established by the reference evidence and the examiner's rejection under 35 U.S.C. § 103(a) cannot be sustained.

Appeal No. 2001-2488
Application No. 09/368,455

The decision of the examiner is reversed.

REVERSED

Thomas A. Waltz)
Administrative Patent Judge))
)
)
) BOARD OF PATENT
Romulo H. Delmendo)
Administrative Patent Judge) APPEALS AND
) INTERFERENCES
)
)
Jeffrey T. Smith)
Administrative Patent Judge)

TAW/eld

Appeal No. 2001-2488
Application No. 09/368,455

William W. Jones
6 Junieper Lane
Madison, CT 06443

Appeal No. 2001-2488
Application No. 09/368,455

APPENDIX

1. A hydrocarbon fuel gas steam reformer assemblage comprising:

- a) at least one process gas passage, said process gas passage having an inlet end and an outlet end, said process gas passage being operable to direct a stream of a fuel gas and steam mixture through said assemblage in a first direction;
- b) at least one burner gas passage disposed in heat transfer relationship with said process gas passage, said burner gas passage having an inlet end and an outlet end, and said burner gas passage being operable to direct a stream of a burner gas through said assemblage in a second direction which is counter to said first direction;

and

- c) a plurality of heat transfer fins disposed in said burner gas passage, said heat transfer fins being present in a population density gradient from said burner gas passage inlet end to said burner gas passage outlet end, said fin population density gradient providing minimal heat transfer to walls of said burner gas passage in an inlet section of said burner gas passage; and said fin population density gradient providing increased heat transfer to said walls of said burner gas passage in an intermediate section of said burner gas passage; and said fin population density gradient providing still greater heat transfer to said walls of said burner gas passage in an outlet section of said burner gas passage.