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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 19

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte RANDAL G. MCKINNEY and FRANKLIN J. DAVIS

Appeal No. 99-1962
Application 08/671,463[1]

ON BRIEF

Before STAAB, NASE and GONZALES, *Administrative Patent Judges*.

STAAB, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on an appeal from the examiner's final rejection of claims 1-3, 6-8 and 11-13. Claims 4, 5, 9, 10, 14 and 15, the only other claims remaining in the application,

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[1] Application for patent filed June 27, 1996.

have been indicated by the examiner as being allowable if rewritten in independent form to include all the limitations of the base claim and any intervening claim.

Appellants' invention pertains to a fuel nozzle guide for use in a gas turbine engine, and in particular to a fuel nozzle guide for improving bulkhead film cooling. To this end, the radially extending ribs typically found on the flange of a prior art fuel nozzle guide are provided with trailing ends that are rounded off. According to appellants, the rounding off of the trailing ends contributes to a reduction in "the formation of vortices . . . , [thereby] resulting in a lower risk of hot gases becoming entrained and causing thermal distress to the heat shield 58" (specification, page 7). Independent claim 11 is illustrative of the appealed subject matter and reads as follows:[2]

[2] The bracketed numerals added to claim 11 are with reference to the fuel nozzle guide as shown in Figures 3 and 4 of the instant application. Consistent with appellants' disclosure, in paragraph (c) of claim 11, "each of said ribs having leading ends and trailing ends" would more appropriately be --each of said ribs having a leading end and a trailing end--. In deciding this appeal, we have so interpreted this claim language, and the similar language that appears in each of independent claims 1 and 6.

11. In a combustor for a gas turbine engine, a fuel nozzle guide comprising:

(a) an annular bushing [52] sized for receiving a fuel nozzle, said bushing having a first end and a second end, said first end being connected to means for securing said fuel nozzle guide within said combustor;

(b) a flange [54] extending radially from said second end of said bushing, said flange having a proximal portion spaced proximal to said bushing, and a distal portion spaced distal from said bushing; and

(c) a plurality of radially extending ribs [66] disposed about said distal portion of said flange, each of said ribs having leading ends [68] and trailing ends [70], said trailing ends being arcuate in shape, wherein said arcuate trailing ends facilitates [sic] a reduction in film cooling air vortices as film cooling air passes between said ribs.

The sole reference of record relied upon by the examiner as evidence of obviousness is:

Butler 5,463,864 Nov. 7, 1995

Claims 1-3, 6-8 and 11-13 stand rejected under 35 U.S.C. § 103 as being unpatentable over Butler. The examiner explains the rejection on page 5 of the answer as follows:

> Butler discloses fuel nozzle support structure substantially similar to the present invention. With reference to Figures 2 and 3, attention is called to fuel nozzle support bushing 105, retainer 125, and heat shield 110. As in the case of the

> present invention, there are ribs (unnumbered) separating the distal portion of a radial flange on the bushing from the heat shield. Butler's drawing includes no radial cross section showing the ribs' leading and trailing edge configuration, but according to appellants, such prior art ribs comprise squared-off edges as shown in Figures 5 and 6 of the present application. Assuming this is true, one skilled in the art would have been well aware of the fact that such square-edged flow elements are prone to aerodynamic losses and accompanied by phenomena such as the trailing edge vortices shown in appellants' Figure 6. The nominal addition of aerodynamically contoured (arcuate) leading and trailing edges to Butler's ribs would have simply been an obvious expedient to eliminate such predictable losses. Moreover, the addition of such contoured edges is consistent with conventional streamlining techniques. The decision to apply such techniques involves no patentable novelty; it is nothing more than a classic engineering tradeoff between cost and performance.

We fully appreciate the points raised by the examiner in the answer in rejecting the appealed claims, including not only those set forth in the above quoted explanation of the rejection, but also those made by the examiner in the answer in responding to appellants' argument. Having carefully considered appellants' specification and claims, the teachings of the applied reference, and the respective positions expressed by appellants and the examiner, it is our determination that the § 103 rejection of claims 1-3, 6-8 and

11-13 on appeal should not be sustained. Our reasons follow.

Initially, for purposes of our discussion of the examiner's rejection, we will presume that the distal end of the flange of Butler's fuel nozzle guide 105 includes ribs like those shown in prior art Figures 5 and 6 of the present application. This being the case, the only asserted difference between Butler and representative claim 11 is the requirement that the trailing end of each of the ribs of the flange be arcuate in shape, wherein the arcuate trailing ends facilitate a reduction in film cooling air vortices as film cooling air passes between the ribs.

It is by now well settled that a rejection based on 35 U.S.C. § 103 must rest on a factual basis, with the facts being interpreted without hindsight reconstruction of the invention from the prior art. In making this evaluation, the examiner has the initial duty of supplying the factual basis for the rejection he advances. He may not, because he doubts that the invention is patentable, resort to speculation, unfounded assumptions or hindsight reconstruction to supply deficiencies in the factual basis. *In re Warner*, 379 F.2d 1011, 1017, 154 USPQ 173, 178 (CCPA 1967), *cert. denied*, 389

U.S. 1057 (1968).

Turning to the specifics of the standing § 103 rejection, the examiner's contention on page 5 of the answer that "one skilled in the art would have been well aware of the fact that such square-edged flow elements are prone to aerodynamic losses and accompanied by phenomena such as the trailing edge vortices shown in appellants' Figure 6" is without foundation in the applied Butler reference. The thrust of Butler is the eccentric detent 150 for retaining the retainer 125, and not the structure of the flange of the fuel nozzle guide 105. Butler does not voice any concern whatsoever for the construction of the flange of the fuel nozzle guide 105, much less any ribs thereon, or the particular shape of the trailing ends of the ribs, to promote the flow of cooling air. Also, the examiner's further contention on page 5 of the answer that appellants' invention "is nothing more than a classic engineering tradeoff between cost and performance" is likewise flawed because it inappropriately assumes that the ordinarily skilled artisan would consider making the trailing ends of the ribs arcuate according to "conventional streamlining techniques" as a performance enhancing modification. For all

the evidence relied upon by the examiner teaches, one of ordinary skill in the art at the time of appellants' invention may have considered streamlining the ribs of the fuel nozzle guide of Butler to be of no significant benefit, or for that matter, even detrimental to the overall performance of the fuel nozzle guide. From our perspective, the only suggestion for making the trailing ends of the ribs of the prior art fuel nozzle guide arcuate comes from hindsight knowledge gleaned from first reading appellants' disclosure. In the present instance, when we forget about what appellants have done and cast ourselves back to the state of the art at the time of Butler, we do not believe the examiner has established that it would have been obvious to one of ordinary skill in the art to have provided any ribs that may be present on the flange of Butler's fuel nozzle guide with trailing ends that are arcuate in shape, as now claimed.

Since we perceive no factual basis in the reference evidence relied upon by the examiner which supports the proposed modification so as to result in that which is claimed by appellants in the appealed claims, and have determined that the examiner's conclusion of obviousness is based on hindsight

reconstruction of the claimed invention, we will not sustain the examiner's rejection of the appealed claims under 35 U.S.C. § 103.

The decision of the examiner is reversed.

REVERSED

LAWRENCE J. STAAB Administrative Patent Judge	)	
JEFFREY V. NASE Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
JOHN F. GONZALES Administrative Patent Judge	)	

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