

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 22

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ROLLIN G. GIFFIN III

Appeal No. 2002-1840
Application 09/134,993

ON BRIEF

Before COHEN, McQUADE, and NASE, Administrative Patent Judges.
McQuade, Administrative Patent Judge.

DECISION ON APPEAL

Rollin G. Giffin III appeals from the final rejection of claims 1 through 19, all of the claims pending in the application.

THE INVENTION

The invention relates to "a system for providing tailored pressure boosted cooling flows for high pressure compressor and

Appeal No. 2002-1840
Application 09/134,993

turbine components" (specification, page 1). Representative claim 1 reads as follows:

1. A gas turbine engine cooling system for providing cooling air to engine components, said system comprising:

a core engine having, in downstream serial flow relationship, a high pressure compressor, a combustor, and high pressure turbine drivingly connected to said high pressure compressor and a core flowpath therethrough;

said high pressure compressor being effective for providing pressurized air;

a first flowing means for flowing a portion of the pressurized air to a heat exchanger to cool the portion of the pressurized air and form the cooling air;

a second flowing means for flowing a first portion of the cooling air to a compressor impeller for boosting pressure of the first portion of the cooling air and operable for flowing a second portion of the cooling air to a turbine cooling means for cooling components of said high pressure turbine; and

said compressor impeller operably connected to a compressor disk of said high pressure compressor.

THE PRIOR ART

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

Zaehring et al. (Zaehring)	4,808,073	Feb. 28, 1989
Liebl	4,961,309	Oct. 9, 1990
Narayana et al. (Narayana)	5,226,785	Jul. 13, 1993
Burrus	5,619,855	Apr. 15, 1997

Appeal No. 2002-1840
Application 09/134,993

THE REJECTIONS

Claim 1 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Liebl in view of Burrus and Zaehring.

Claims 2 through 19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Liebl in view of Burrus, Zaehring and Narayana.

Attention is directed to the appellant's main and reply briefs (Paper Nos. 15 and 17) and to the examiner's final rejection and answer (Paper Nos. 7 and 16) for the respective positions of the appellant and the examiner regarding the merits of these rejections.

DISCUSSION

Liebl, the examiner's primary reference, discloses a gas turbine engine comprising, in downstream serial flow relationship, a high pressure compressor, a combustor and a high pressure turbine. According to Liebl,

[t]he invention is directed to the venting of the [compressor] rotor by utilizing a portion of the [primary] stream 8 of compressed air which has passed through the last stage of the compressor and the

diffuser 2. The portion of the stream 8 which is utilized for venting is shown as stream 9. An annular chamber or space 11 is formed downstream of the rotor disk 5 between opposed rotor and stator parts and receives the stream 9 of compressed air. From the space 11, the stream 9 is divided essentially into two individual streams 12 and 14. Stream 14 is recycled to the flow channel of the compressor via an annular slot 13 formed between the rotor vanes 4 and the stator vanes 1 of the last compressor stage. The stream 12 is discharged as leakage air into the secondary air system of the turbine, for example, for turbine cooling purposes [column 2, lines 43 through 57].

The examiner concedes (see pages 2 and 3 in the final rejection) that Liebl does not respond to the limitations in independent claim 1 relating to the "heat exchanger" and the "compressor impeller." The Liebl gas turbine engine has no such elements. To overcome these deficiencies, the examiner turns to Burrus and Zaehring.

Burrus discloses a gas turbine engine wherein a portion 32 of the compressed air exiting a high pressure compressor is bled through an opening 102 and into a fuel-air heat exchanger 100 where it is cooled and then routed through a turbine inlet nozzle vane 42 to various portions of a combustor. Zaehring discloses a gas turbine engine wherein cooling air tapped from a low pressure compressor is impelled by vane-like ribs 9 into cooling contact

Appeal No. 2002-1840
Application 09/134,993

with the late stage rotor disks 3 and 6 of a high pressure compressor. In proposing to combine Liebl, Burrus and Zaehring to reject claim 1, the examiner submits that it would have been obvious to one of ordinary skill in the art

to have the cooling air of Liebel [sic] further cooled by the heat exchanger of Burrus, because the higher pressure ratios in jet engines at the time of the claimed invention rendered the air at the compressor exit too hot for cooling purposes . . . [and] to use the Zaehring compressor [sic, impeller] in the Liebel [sic] gas turbine engine, in order to enable the cooling flow 14 [to] negotiate the adverse pressure gradient required to reach the root of the last compressor stage of the engine [final rejection, page 3].

Liebl, however, gives no indication that recycled air stream 14 is too hot for its intended purpose or is impeded from entering the compressor by an adverse pressure gradient. The examiner's speculation that the Liebl engine experiences these problems is completely lacking in evidentiary support. Furthermore, Burrus does not use heat exchanger 100 to prepare air for cooling a compressor and Zaehring does not utilize impeller ribs 9 to feed cooling air into a compressor. In this light, it is evident that the only suggestion for combining Liebl, Burrus and Zaehring in the manner proposed by the examiner

Appeal No. 2002-1840
Application 09/134,993

so as to arrive at the invention set forth in claim 1 stems from hindsight knowledge impermissibly derived from the appellant's disclosure.

Hence, we shall not sustain the standing 35 U.S.C. § 103(a) rejection of claim 1 as being unpatentable over Liebl in view of Burrus and Zaehring.

As Narayana does not cure the above noted shortcomings of the basic reference combination relative to the subject matter recited in parent claim 1, we also shall not sustain the standing 35 U.S.C. § 103(a) rejection of dependent claims 2 through 19 as being unpatentable over Liebl in view of Burrus, Zaehring and Narayana.

Appeal No. 2002-1840
Application 09/134,993

SUMMARY

The decision of the examiner to reject claims 1 through 19
is reversed.

REVERSED

IRWIN CHARLES COHEN)	
Administrative Patent Judge)	
)	
)	
)	BOARD OF PATENT
JOHN P. McQUADE)	
Administrative Patent Judge)	APPEALS AND
)	
)	INTERFERENCES
)	
JEFFREY V. NASE)	
Administrative Patent Judge)	

JPM:pgg

Appeal No. 2002-1840
Application 09/134,993

Steven J. Rosen
4729 Cornell Road
Cincinnati, OH 45241