

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* BERNARD J. RAVER

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Appeal 2007-0147  
Application 10/631,440  
Technology Center 1700

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| Decided: October 22, 2007

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Before EDWARD C. KIMLIN, BRADLEY R. GARRIS, and  
CATHERINE Q. TIMM, *Administrative Patent Judges*.

KIMLIN, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 1-4, 6-12, and 14-30. Claims 1 and 17 are illustrative:

1. A method for generating electricity from a turbofan engine comprising the steps of:

depositing a plurality of alternating portions of an N-type material and a P-type material in series on a turbofan engine component; and

providing an electrically conductive material between each of two adjoining portions of said N-type material and said P-type material to form a circuit.

17. A turbofan engine comprising:

at least one turbofan engine component comprising a plurality of alternating portions of an N-type material and a P-type material connected in series on said turbofan engine component via an electrically conductive material to form a circuit.

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

Alsing	3,054,840	Sep. 18, 1962
Cummings	4,148,192	Apr. 10, 1979
Nash	4,312,185	Jan. 26, 1982
Morimoto (as translated)	JP 2-40075 A	Feb. 8, 1990
Coffinberry	5,918,458	Jul. 6, 1999
Parise	5,968,456	Oct. 19, 1999
Hamedani	5,996,336	Dec. 7, 1999

Appellant's claimed invention is directed to a turbofan engine and a method of generating electricity therefrom. The engine comprises a component that includes a plurality of alternating portions of an N-type material and a P-type material connected in series by an electrically conductive material which forms the circuit. The turbofan engine generates heat during its operation that is absorbed by the N-type and P-type materials which then produces electricity that is released through the conductor material to generate the electric current. Hence, it can be seen that the component comprising the N-type, P-type and conductive material uses the heat generated by the turbofan to produce electricity.

The appealed claims stand rejected under 35 USC 103(a) as follows:

- (a) claims 1-3, 6-11, and 14-27 over Parise in view of Cummings, Coffinberry and Hamedani,
- (b) claims 4 and 12 over the stated combination of references further in view of Morimoto and Nash, and
- (c) claims 28-30 over the combination of references stated in (a) above further in view of Alsing.

We have thoroughly reviewed each of Appellant's arguments for patentability. However, we find ourselves in complete agreement with the Examiner's reasoned analysis and application of the prior art, as well as his cogent and thorough disposition of the arguments raised by Appellant. Accordingly, we will adopt the Examiner's reasoning as our own in sustaining the rejections of record, and we add the following for emphasis only.

There is no dispute that Parise, like Appellant, discloses a method for generating electricity from an engine comprising the recited steps of "depositing a plurality of alternating portions of an N-type material and a P-type material in series" in proximity to an engine component and "providing an electrically conductive material between each of two adjoining portions of said N-type material and said P-type material to form a circuit" (Appealed claim 1). The principal argument advanced by Appellant is that Parise does not disclose that the thermoelectric generator, the device comprising the presently claimed alternating portions of N-type and P-type material joined by conductive material, is in association with a turbofan engine. Appellant maintains that Parise is directed to utilizing the heat generated by an internal combustion engine of an automobile and "absent

from the entire disclosure of Parise is any teaching directed to applying such technology to gas turbine engines or turbofan engines for aircraft" (Principal Br. 7, last para.).

At the outset, we note that Appellant's argument is not germane to the claimed subject matter on appeal. None of the claims on appeal recite or require a gas turbine engine or any turbine engine for aircraft. Furthermore, the presence of such limitations in the appealed claims would not render the appealed claims nonobvious to one of ordinary skill in the art in view of the applied prior art. We fully concur with the Examiner that Cummings evidences the obviousness of mounting the thermoelectric generator of Parise on the outer walls of the internal combustion engine, and that the internal combustion engine can be a gas turbine. Also, Coffinberry provides the teaching that the gas turbine engine of Cummings may be a turbofan engine. Inasmuch as Cummings further teaches that the waste heat of a gas turbine engine can be recovered by thermoelectric semiconductors (35), we are convinced that it would have been obvious for one of ordinary skill in the art to employ the thermoelectric generator of Parise to recover the heat generated from a turbofan engine to produce electricity.

Moreover, we agree with the Examiner that one of ordinary skill in the art would have readily understood that the disclosure of Parise is applicable to the recovery of heat generated by any engine, not only the internal combustion engine of an automobile. While the Examiner properly cites Hamedani for the use of a catalytic converter with a turbofan engine, it is our view that the claimed subject matter would have been obvious to one of ordinary skill in the art over the Parise disclosure alone. We are satisfied that one of ordinary skill in the art, cognizant of Parise's teaching of

employing a thermoelectric generator for transforming the heat energy of an internal combustion engine into electrical energy, would have found it obvious to utilize the thermoelectric generator of Parise with any heat-generating engine to produce electrical energy and maximize efficiency of the system by avoiding waste. Appellant has presented no argument that there is something peculiar about a turbofan engine that would not have made it amenable for use with a thermoelectric generator of the type disclosed by Parise. Appellant has presented no argument that indicates why one of ordinary skill in the art would have been dissuaded from using a known thermoelectric generator with a turbofan engine. Hence, the *prima facie* case of obviousness established by the Examiner stands unrebutted.

As a final point, we note that Appellant bases no argument upon objective evidence of nonobviousness, such as unexpected results, which would outweigh the evidence of obviousness presented by the Examiner.

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 C.F.R. § 1.136(a)(vi)(effective Sept. 13, 2004).

AFFIRMED

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