

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 24

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte GERT JAKOB,
JOACHIM ZIMMERMANN,
FRIEDRICH HORN,
HANS RUMMEL,
THOMAS SUTTER,
DIETER KARR,
KARL SCHUPP,
DIETER NEUHAUS,
DIETER HUSSMANN and
PETER JARES

Appeal No. 1996-3108
Application 08/064,010

ON BRIEF

Before HAIRSTON, FLEMING and DIXON, Administrative Patent Judges.

HAIRSTON, Administrative Patent Judge.

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DECISION ON APPEAL

This is an appeal from the final rejection of claims 23 through 32 and 46 through 56.

The disclosed invention relates to a heat conductive layer and a cooling element that dissipate heat from a power component mounted on a printed circuit board. The heat conductive layer is applied to the printed circuit board, and the largest face of the power component is in contact with the heat conductive layer. The cooling element is spaced from the power component, and dissipates the heat imparted to the heat conductive layer by the power component.

Claim 23 is illustrative of the claimed invention, and it reads as follows:

23. Electrical device comprising:
a printed circuit board (10) carrying an electronic circuit and at least one power component (11) to be cooled, each of said at least one power component (11) having a largest face;

a heat conductive layer (13) applied to said printed circuit board at least in the vicinity of said at least one power component (11), each of said at least

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one power component resting flat with said largest face in contact with said heat conductive layer (13); and

a cooling element for dissipation of heat conducted from said at least one power component (11) by said heat conductive layer to said cooling element, said cooling element being spaced from said at least one power component.

The references relied on by the examiner are:

Ezzo	3,061,760	Oct. 30, 1962
Wigley ¹	4,204,247	May 20, 1980
Craft	4,941,067	July 10, 1990

"Heat Sink Assembly for TAB-Mounted Devices," IBM Technical Disclosure Bulletin, Vol. 31, No. 6, November 1988, pages 372 and 373 (hereinafter IBM TDB).

Claims 23 through 29, 46 through 51 and 53 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Ezzo.

¹The examiner lists Wigley among the prior art of record (Answer, page 3), but thereafter states (Answer, page 7) that Wigley "is hereby withdrawn as a reference." As a result thereof, the 35 U.S.C. § 102(b) rejection of claims 23 through 28 and 46 through 52 based upon the teachings of Wigley is withdrawn, and the 35 U.S.C. § 103 rejection of claims 31, 32, 55 and 56 is now over the teachings of the IBM TDB alone. The withdrawal of this reference also results in the lack of a prior art rejection of claim 52.

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Claims 23 through 27 and 46 through 51 stand rejected under 35 U.S.C. § 102(b) as being anticipated by the IBM TDB.

Claims 30 and 54 stand rejected under 35 U.S.C. § 103 as being unpatentable over Ezzo in view of Craft.

Claims 31, 32, 55 and 56 stand rejected under 35 U.S.C. § 103 as being unpatentable over the IBM TDB.

Reference is made to the final rejection, the revised brief, the reply brief² and the answer for the respective positions of the appellants and the examiner.

OPINION

Except for the 35 U.S.C. § 102(b) rejection of claims 23 through 27 and 46 through 51, all of the rejections are reversed.

According to the examiner (Answer, page 4), "Ezzo discloses a board 11 with superposed layers 12, 12a with

²The brief as opposed to the reply brief is the proper vehicle to present initial arguments concerning the patentability of a claim on appeal. The reply brief should be limited to a response to any new arguments made by the examiner.

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copper electrically deposited (printed) on opposite sides of board 11 to constitute the inner layers 12a and when silver is flashed over the deposited copper to constitute the outer layers 12 thus with this teaching falling into what the examiner considers a broad meaning of a printed circuit board to one of ordinary skill." Appellants argue, inter alia, that "[t]here is no printed circuit on the nonconducting board of Ezzo" (revised Brief, page 10). We agree. Ezzo is completely silent as to a printed circuit on nonconductive board 11. For this reason, the 35 U.S.C.

§ 102(b) rejection of claims 23 through 29, 46 through 51 and 53 is reversed because anticipation can be found only if the prior art reference discloses every element of the claims. In re King, 801 F.2d 1324, 1326, 231 USPQ 136, 138 (Fed. Cir. 1986).

Turning next to the 35 U.S.C. § 102(b) rejection of claims 23 through 27 and 46 through 51, we find that all of the limitations of claims 23 through 25, 48 and 49 read

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directly on the teachings of the IBM TDB. Appellants' arguments (revised Brief, pages 14 and 15) to the contrary notwithstanding, the thermal adhesive in the IBM TDB is a heat conductive layer "applied to said printed circuit board at least in the vicinity of said at least one power component", and the chip located thereon is a power component in the sense that power is supplied thereto. Appellants' argument (revised Brief, page 15) concerning the "comparatively large distance" that the FINS (i.e., the cooling elements) are from the chip is without any merit because specific distances are not recited in claim 23 on appeal. Appellants' argument (revised Brief, page 15) that "the heat conducting layer is not on top of the nonconducting circuit board substrate is likewise without merit because Figures 2 and 3 of the IBM TDB clearly show the thermal adhesive on top of the circuit board substrate. In the IBM TDB, the copper layered construction of the circuit board substrate is broadly speaking a "metal cladding" as set forth in claims 24 and 48, and the thermal

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adhesive forms a heat conductor track as set forth in claims 25 and 49. Accordingly, the 35 U.S.C. § 102(b) rejection of claims 23 through 25, 48 and 49 based upon the teachings of the IBM TDB is sustained. In keeping with appellants' grouping of the claims (revised Brief, page 7), the 35 U.S.C. § 102(b) rejection of claims 26, 27, 46, 47, 50 and 51 based upon the teachings of the IBM TDB is sustained.

The 35 U.S.C. § 103 rejection of claims 30 and 54 is reversed because Ezzo does not disclose a printed circuit board, and because Craft considered alone or in combination with Ezzo would not have suggested the claimed invention.

The 35 U.S.C. § 103 rejection of claims 31, 32, 55 and 56 is reversed because the IBM TDB neither teaches nor would have suggested to the skilled artisan the relative thicknesses recited in these claims.

DECISION

The decision of the examiner is affirmed as to the

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35 U.S.C. § 102(b) rejection of claims 23 through 27 and
46 through 51. The examiner's decision is reversed as to

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all of the other rejected claims. In summary, the decision of the examiner is affirmed-in-part.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED-IN-PART

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KENNETH W. HAIRSTON)	
Administrative Patent Judge)	
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)	
)	BOARD OF PATENT
MICHAEL R. FLEMING)	
Administrative Patent Judge)	APPEALS AND
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)	INTERFERENCES
)	
JOSEPH L. DIXON)	
Administrative Patent Judge)	

KWH:hh

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Striker, Striker & Stenby
103 East Neck Road
Huntington, NY 11743