

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. 21

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte LENNY LOW and CHRIS GOODMAN

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Appeal No. 2003-2056  
Application No. 09/377,442

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ON BRIEF

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Before COHEN, ABRAMS, and McQUADE, Administrative Patent Judges.  
ABRAMS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1-14, which are all of the claims pending in this application.

We REVERSE.

BACKGROUND

The appellants' invention relates to a heat dissipating apparatus for use on a spacecraft. An understanding of the invention can be derived from a reading of exemplary claim 1, which has been reproduced below.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Esposito	5,743,325	Apr. 28, 1998
Watts	5,806,803	Sep.15, 1998
Japanese Kokai Patent Application <sup>1</sup> (Miyasaka)	SHO 63[1988]-83586	Apr. 14, 1988

Claims 1-12 and 14 stand rejected under 35 U.S.C. § 103 as being unpatentable over Esposito in view of Miyasaka.

Claim 13 stands rejected under 35 U.S.C. § 103 as being unpatentable over Esposito in view of Miyasaka and Watt.

Rather than reiterate the conflicting viewpoints advanced by the examiner and the appellants regarding the above-noted rejections, we make reference to the Answer (Paper No. 18) for the examiner's complete reasoning in support of the rejections, and to the Brief (Paper No. 17) ) for the appellants' arguments thereagainst.

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<sup>1</sup>Our understanding of this foreign language reference was obtained from a PTO translation, a copy of which is enclosed.

### OPINION

In reaching our decision in this appeal, we have given careful consideration to the appellants' specification and claims, to the applied prior art references, and to the respective positions articulated by the appellants and the examiner. As a consequence of our review, we make the determinations which follow.

The appellants' invention provides for a spacecraft radiator system comprising a crossing heat pipe system that utilizes heat pipes to thermally couple radiator panels on opposite sides of the spacecraft. The invention is recited in claim 1 in the following manner.

1. Heat dissipating apparatus for use in a spacecraft, comprising:

first and second radiator panels disposed on opposing faces of a spacecraft that each comprise an outer panel faceskin, an inner panel faceskin, and a heat pipe matrix disposed between the outer and inner panel faceskins;

a transverse panel interconnecting the first and second radiator panels that is oriented transverse to the first and second radiator panels; and

a plurality of crossing heat pipes extending between and thermally coupled to the heat pipe matrices of the first and second radiator panels that extend outside the transverse panel.

The examiner has rejected this claim as being obvious in view of the combined teachings of Esposto and Miyasaka. The test for obviousness is what the combined teachings of the prior art would have suggested to one of ordinary skill in the art. See,

for example, In re Keller, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981). In establishing a prima facie case of obviousness, it is incumbent upon the examiner to provide a reason why one of ordinary skill in the art would have been led to modify a prior art reference or to combine reference teachings to arrive at the claimed invention. See Ex parte Clapp, 227 USPQ 972, 973 (Bd. Pat. App. & Int. 1985). To this end, the requisite motivation must stem from some teaching, suggestion or inference in the prior art as a whole or from the knowledge generally available to one of ordinary skill in the art and not from the appellants' disclosure. See, for example, Uniroyal, Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 1052, 5 USPQ2d 1434, 1439 (Fed. Cir.), cert. denied, 488 U.S. 825 (1988). Applying this guidance to the situation at hand leads us to conclude that the rejection of claim 1 cannot be sustained. Our reasoning follows.

Like the appellants' invention, Esposito is directed to a radiator for spacecraft applications. While Esposito discloses a pair of radiator panels flanking an interconnecting panel, it fails to disclose or teach that the heat pipe matrixes positioned on the radiator panels are disposed between outer and inner faceskins, a shortcoming admitted by the examiner on page 4 of the Answer. The appellants further point out that Esposito does not disclose that the heat pipes are arranged in a matrix, with which we also agree. The examiner takes the position that it would have been obvious to one of ordinary skill in the art to modify the Esposito structure by placing the radiator panels between outer and inner faceskins in view of the teaching of Miyasaka "for the purpose

of permitting the panels to be controlled so as to have a uniform temperature distribution and increasing the structural strength of the panels,” and comments that the pipes are configured in a manner that meets the definition of “matrix” (Answer, page 4).

Miyasaka relates to a panel that improves the heat transmission between pipes that are oriented in different directions. This is accomplished by embedding the crossing heat pipes in a sandwich core 3 between two facings (facesheets) 1 and 2. According to Miyasaka, this structure holds the pipes in the proper relationship without the use of adhesives, which interfere with efficient heat transfer (translation, pages 3 and 4). Esposto primarily is concerned with the construction of the flexible serpentine heat pipes 20 that are used to connect the heat pipes shown disposed on the deployable radiators 10 to the heat pipes on stationary transverse panel 14. The configuration of the heat pipes on the radiators is not described in the reference, but from Figure 1 each appears to comprise a single pipe arranged in a squared-corner serpentine fashion between the points of connection with flexible pipes 20. There are no crossing pipes, and therefore it is our view that the teachings of Miyasaka have no applicability to Esposto, that is, there are no crossing pipes that need to be placed between facesheets, and thus there would have been no motivation to one of ordinary skill in the art to modify Esposto by providing the claimed facesheets. Suggestion to combine the references in the manner proposed by the examiner being lacking, the combined teachings of Esposto and Miyasaka fail to establish a prima facie case of

obviousness with regard to the subject matter of claim 1, and the rejection cannot be sustained.

In addition, we do not agree with the examiner that the heat pipes on the Esposito radiator panels comprise a “matrix,” the common applicable definition of which is a rectangular arrangement of elements in rows and columns.<sup>2</sup> The Esposito heat pipes are arranged in a serpentine fashion, and while the corners are squared the pipes do not cross, and we agree with the appellants that they thus are not arranged in rows and columns, which would require that they cross. This shortcoming also causes the rejection of claim 1 to be fatally defective.

In view of the foregoing, the rejection of independent claim 1 and dependent claims 2-12 and 14 is not sustained.

The appellants provided additional arguments directed to claims 4 and 9, which depend from claim 1. With regard to claim 4, the crossing heat pipes in Esposito do not “extend around the outside of each of the respective radiator panels,” as is required by this claim nor, it follows, could they thus be “thermally coupled” to the header heat pipes. Dependent claim 9 requires the presence of “a bonded joint interface . . . formed at intersections between the lateral and header heat pipes,” a feature that is not present in either reference.

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<sup>2</sup>See, for example, Merriam Webster's Collegiate Dictionary, Tenth Edition, 1996, page 717.

Claim 13, which depends from claim 1 through claims 5 and 2, stands rejected on the basis of Esposto and Miyasaka, taken further in view of Watt, which the examiner applied for teaching coupling heat pipes to one another by means of a flange type interface. Be that as it may, Watt does not alleviate the problems we pointed out above regarding claim 1, and therefore this rejection is not sustained.

#### CONCLUSION

Neither rejection is sustained.

The decision of the examiner is reversed.

IRWIN CHARLES COHEN  
Administrative Patent Judge

NEAL E. ABRAMS  
Administrative Patent Judge

JOHN D. McQUADE  
Administrative Patent Judge

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Appeal No. 2003-2056  
Application No. 09/377,442

Page 9

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