

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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**Ex parte** PAOLO CASATI, PIERANGELO MAGNI  
and GIUSEPPE MARCHISI

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Appeal No. 97-4420  
Application No. 07/995,747<sup>1</sup>

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ON BRIEF

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Before JERRY SMITH, FLEMING and CARMICHAEL, **Administrative Patent Judges**.

CARMICHAEL, **Administrative Patent Judge**.

**DECISION ON APPEAL**

This is an appeal from the final rejection of claims 11-24, 26, 28, 31-32, and 34, which constitute all the claims remaining in the application.

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<sup>1</sup> Application for patent filed December 21, 1992.

Appeal No. 97-4420  
Application No. 07/995,747

Claim 11 reads as follows:

11. A packaged electronic device structure, comprising:

a plate of thermally and electrically conductive material;

a microelectronic device chip having a first surface thereof electrically and thermally connected to said plate, and containing one or more miniature electronic devices and one or more bond pads on a second surface thereof;

a plurality of externally accessible conductive leads, each having one end adjacent to said chip, said leads being thinner than said plate;

wires interconnecting said leads to said bond pads of said chip; and a polymer body encapsulating said chip, and each of said wires, and at least part of said plate;

wherein at least some portions of said plate have a surface roughness of greater than  $R_a=1\mu\text{m}$ , and other portions have a surface roughness less than  $R_a=1\mu\text{m}$ ;

wherein at least some portions of said leads have a surface roughness of greater than  $R_a=1\mu\text{m}$ ; and

wherein said plate has undercut surfaces in predetermined areas which contact said polymer body to enhance adhesion thereof to said plate, and wherein said undercut surfaces include areas with roughness  $R_a$  greater than  $1\mu\text{m}$ .

The Examiner's Answer cites the following prior art:

Hayakawa et al. (Hayakawa) 1979	4,151,543	Apr. 24,
McShane 1991	5,041,902	Aug. 20,
Hideo	57-96559	June 15, 1982

Appeal No. 97-4420  
Application No. 07/995,747

Japanese Kokai Patent

Nobuhiro  
16, 1985

60-231349

Nov.

Japanese Kokai Patent

***OPINION***

Claims 11-13, 15-21, 23-24, 26, 28, 31-32, and 34 stand rejected under 35 U.S.C. § 103 as unpatentable over Nobuhiro, Hayakawa, and McShane. Claims 14 and 22 stand rejected under 35 U.S.C. § 103 as unpatentable over Nobuhiro, Hayakawa, McShane, and Hideo.

The claims all recite a packaged electronic device structure having a thermally conductive plate (such as a heat sink for a power integrated circuit device) with undercut surfaces having a roughness value greater than one micron.

According to the examiner, Nobuhiro discloses the claimed device except for the undercut surfaces and the roughness value. Final rejection (Paper No. 17) at 2. The examiner stated that it would have been obvious to use undercut surfaces in Nobuhiro to promote adhesion as taught by McShane, and a roughness greater than one micron as taught by Hayakawa.

Appeal No. 97-4420  
Application No. 07/995,747

Appellants argue that it would not have been obvious to combine Nobuhiro and McShane because Nobuhiro is a non-power device whereas McShane is a power device. Appeal Brief at 6-9. To support that argument, appellants present an expert affidavit from Richard A. Blanchard.

The examiner responds by saying that the claims are not limited to power devices. The examiner does not mention the expert affidavit.

The mere fact that the prior art may be modified in the manner suggested by the examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. *In re Fritch*, 972 F.2d 1260, 1266 n.14, 23 USPQ2d 1780, 1783-84 n.14 (Fed. Cir. 1992).

We agree with appellants. The affidavit supports the argument that power devices (McShane) and non-power devices (Nobuhiro and Hayakama) present different concerns to the skilled artisan and therefore would not have suggested the examiner's proposed combination. Affidavit at 3-4. For example, we are left with no discernible motivation for applying McShane's roughened undercut to Nobuhiro's device.

Appeal No. 97-4420  
Application No. 07/995,747

The examiner's contention, that the claims are not limited to power devices, does not rebut appellants' argument that the power and non-power references are not properly combinable. Even if the references were combinable, the examiner has not identified any surface in Nobuhiro that could be undercut in accordance with McShane's teachings. It appears to us that the rejection relies on improper hindsight.

As to dependent claims 14 and 22, the examiner's reliance on Hideo for coined edges does not remedy the problems of the basic rejection discussed above.

We commend appellants for their thorough yet concise brief. Especially helpful were the consistent citations to specific parts of the record in support of appellants' arguments.

**CONCLUSION**

The rejections are not sustained.

**REVERSED**

Appeal No. 97-4420  
Application No. 07/995,747

JERRY SMITH	)	
Administrative Patent Judge	)	
	)	
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	)	
	)	BOARD OF PATENT
MICHAEL R. FLEMING	)	APPEALS
Administrative Patent Judge	)	AND
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Appeal No. 97-4420  
Application No. 07/995,747

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Appeal No. 97-4420

Application No. 07/995,747

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REVERSED

Prepared: January 24, 2000