

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(2) is not binding precedent of the Board.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. 29

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte H. WARD CONRU,
and STEPHEN G. STARR

Appeal No. 96-1705
Application 08/296,269¹

ON BRIEF

Before HAIRSTON, JERRY SMITH and HECKER, Administrative Patent Judges.

JERRY SMITH, Administrative Patent Judge.

DECISION ON APPEAL

¹ Application for patent filed August 25, 1994. According to the appellants, this application is a continuation of 07/951,292, filed September 09, 1992, now abandoned, which is a continuation 07/625,410, filed December 11, 1990, now abandoned, which is a continuation of 07/493,654, filed March 15, 1990, now abandoned.

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This is a decision on the appeal under 35 U.S.C. § 134 from the examiner's rejection of claims 2-6, 8 and 9, which constitute all the claims remaining in the application.

The disclosed invention pertains to an encapsulated semiconductor module of the type in which a lead frame is bonded to a semiconductor chip. The lead frame has a plurality of conductive fingers cut from sheet stock and having proximal and distal ends. The proximal ends of the conductive fingers are provided with coined bonding regions having a thickness less than the thickness of the sheet stock.

Representative claim 2 is reproduced as follows:

2. An encapsulated semiconductor module comprising:

a semiconductor chip having a major surface with terminals thereon disposed within an encapsulated material;

a lead frame comprising a plurality of self supporting unitary, discrete, and continuous lead frame conductive fingers, formed of metal sheet stock extending over said major surface of said chip at spaced locations from said terminals,

the proximal end of said conductive fingers arranged in a fixed spacing and provided with a coined bonding region adapted to provide a wire bond contact area, and

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the distal ends of said conductive fingers fanning out from said chip and said encapsulating material, and adapted to connect with signal and voltage lines,

characterized by the coined bonding region on each of said proximal ends, of said fingers, being separated from the tip of the proximal end of said fingers by an uncoined region, and

discrete electrical wire means bonded to the coined bonding regions on said conductive fingers and said terminals and electrically connecting said conductors to said terminals.

The examiner relies on the following references:

Pashby et al. (Pashby)	4,862,245	Aug. 29, 1989
Lim	5,164,815	Nov. 17, 1992
	(effectively filed Dec. 22,	
1989)		
Yabe	62-232147	Oct. 12, 1987
(Japanese Kokai)		
Tsukide et al. (Tsukide)	63-283053	Nov. 18, 1988
(Japanese Kokai)		

Claims 8 and 9 stand rejected under 35 U.S.C. § 102(e) as anticipated by the disclosure of Lim or, in the alternative, under 35 U.S.C. § 103 as obvious over the teachings of Lim. Claims 2-6 stand rejected under 35 U.S.C. § 103 as being unpatentable over the teachings of Pashby in view of Yabe and Tsukide².

² Our understanding of Yabe and Tsukide is based on translations provided by the Ralph McElroy Translation Company

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Rather than repeat the arguments of appellants or the examiner, we make reference to the brief and the answer for the respective details thereof.

OPINION

We have carefully considered the subject matter on appeal, the rejections advanced by the examiner and the evidence of anticipation and obviousness relied upon by the examiner as support for the rejections. We have, likewise, reviewed and taken into consideration, in reaching our decision, the appellants' arguments set forth in the brief along with the examiner's rationale in support of the rejections and arguments in rebuttal set forth in the examiner's answer.

It is our view, after consideration of the record before us, that Lim does not fully meet or suggest the obviousness of the invention as recited in claims 8 and 9. We are also of the view that the evidence relied upon and the

for the United States Patent and Trademark Office. Copies of these translations are attached to this decision.

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level of skill in the particular art would not have suggested to one of ordinary skill in the art the obviousness of the invention as set forth in claims 2-6. Accordingly, we reverse.

We consider first the rejection of claims 8 and 9 under 35 U.S.C. § 102(e) as anticipated by Lim or under 35 U.S.C.

§ 103 as unpatentable over Lim. Anticipation is established only when a single prior art reference discloses, expressly or under the principles of inherency, each and every element of a claimed invention as well as disclosing structure which is capable of performing the recited functional limitations. RCA Corp. v. Applied Digital Data Systems, Inc., 730 F.2d 1440, 1444, 221 USPQ 385, 388 (Fed. Cir.); cert. dismissed, 468 U.S. 1228 (1984); W.L. Gore and Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 1554, 220 USPQ 303, 313 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984).

The examiner indicates how he reads claims 8 and 9 on Lim on pages 3-4 of the answer. There, the examiner asserts that "[a]s seen in Figure 2b, the degree of thickness of the

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lead frame conductors vary from the proximal ends to the distal ends." Appellants dispute that Figure 2b of Lim discloses the thickness limitation of the proximal ends as recited in claims 8 and 9 [brief, pages 13-19]. With respect to this particular limitation of claims 8 and 9, we are in agreement with appellants.

Claims 8 and 9 each recites that the proximal ends of the conductors have a thickness less than "said selected thickness." The antecedent basis for "said selected thickness" is the thickness of the metal sheet stock from which the lead frame is formed. The thickness identified by the examiner runs in a direction perpendicular to the thickness of the metal stock sheet. Thus, all the examiner has identified is that the proximal ends of the conductors in Lim have a width which is less than the width of the distal ends of the conductors. No comparison of thicknesses with the thickness of the metal sheet stock is indicated in Lim. In fact, Lim's Figure 2c suggests that there is no change in thickness as claimed between the proximal ends of the conductors and the metal sheet stock. Therefore, Lim does not fully meet the invention as required by 35 U.S.C. § 102.

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We now consider the alternative rejection of claims 8 and 9 under 35 U.S.C. § 103 as being unpatentable over the teachings of Lim. In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the examiner to establish a factual basis to support the legal conclusion of obviousness. See In re Fine, 837 F.2d 1071, 1073, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). In so doing, the examiner is expected to make the factual determinations set forth in Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), and to provide a reason why one having ordinary skill in the pertinent art would have been led to modify the prior art or to combine prior art references to arrive at the claimed invention. Such reason must stem from some teaching, suggestion or implication in the prior art as a whole or knowledge generally available to one having ordinary skill in the art. Uniroyal, Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir.), cert. denied, 488 U.S. 825 (1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 293, 227 USPQ 657, 664 (Fed. Cir. 1985), cert. denied, 475 U.S. 1017 (1986); ACS Hosp. Sys., Inc. v.

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Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). These showings by the examiner are an essential part of complying with the burden of presenting a prima facie case of obviousness. Note In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992).

As we noted above in our discussion of the rejection of claims 8 and 9 under 35 U.S.C. § 102, the examiner has misconstrued the scope of the invention as recited in these claims. The limitation of the thickness of the proximal end of the conductors being less than the thickness of the metal sheet stock is not met by the disclosure of Lim. Since the examiner treated this limitation as being fully met by the disclosure of Lim, the examiner has not addressed the obviousness of the difference between this claim limitation and the teachings of Lim. Therefore, the examiner has failed to establish a prima facie case of the obviousness of claims 8 and 9. Accordingly, we do not sustain the examiner's rejection of claims 8 and 9.

We now consider the rejection of claims 2-6 under 35 U.S.C. § 103 as being unpatentable over the teachings of

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Pashby in view of Yabe and Tsukide. Pashby teaches an encapsulated semiconductor module similar to what appellants disclosed as being the admitted prior art. The examiner recognized that the module of Pashby did not have coined regions as recited in independent claims 2 and 3. The examiner cited Yabe and Tsukide as teaching the use of lead frame conductors having coined bonding regions and uncoined regions. The examiner concluded that it would have been obvious to the artisan to modify the Pashby module to have coined and uncoined regions as taught by Yabe and Tsukide [answer, pages 4-5].

Appellants argue that Yabe is not within the art of wire bonded lead frames. Appellants also argue that the Pashby device was designed to avoid the very connection problems accepted in Tsukide. Thus, appellants argue that there is absolutely no motivation to modify the Pashby device to have conductors with coined and uncoined regions except in an effort to reconstruct this invention in hindsight [brief, pages 7-13]. We agree with appellants' arguments set forth in the brief.

We agree with appellants that Yabe is not concerned

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with a lead frame encapsulated with a semiconductor chip. Therefore, there is no reason for the artisan to look to Yabe to improve the connections in Pashby. Even if the TAB lead 7 in Yabe were considered to be the conductor of claims 2 and 3, the "coined" or concave region of TAB lead 7 is not used for bonding in Yabe as required by the last clause of claims 2 and 3.

We also agree with Appellants that the disparate solutions to the connection problem employed by Pashby and Tsukide do not lend themselves to being combined absent an attempt to reconstruct appellants' invention in hindsight. The problem solved by the Tsukide device is not present in Pashby, and, therefore, there would be no motivation to combine the teachings of Tsukide with the teachings of Pashby. Thus, we cannot accept the examiner's rationale as to why the artisan would seek to modify Pashby to include conductors with coined and uncoined regions based on the teachings of Tsukide. Therefore, we do not sustain the examiner's rejection of claims 2-6.

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In summary, we have not sustained either of the examiner's rejections of the claims. Therefore, the decision of the examiner rejecting claims 2-6, 8 and 9 is reversed.

REVERSED

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Kenneth W. Hairston))
Administrative Patent Judge)	
)	
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)	BOARD OF PATENT
Jerry Smith)	
Administrative Patent Judge)	APPEALS AND
)	
)	INTERFERENCES
)	
Stuart N. Hecker)	
Administrative Patent Judge)	

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