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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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 27

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte SATYA CHILLARA and
SHAHRAM MOSTAFAZADEH

Appeal No. 1997-1885
Application No. 08/296,671¹

ON BRIEF

Before JERRY SMITH, FRAHM and BARRY, Administrative Patent Judges.

JERRY SMITH, Administrative Patent Judge.

DECISION ON APPEAL

¹ Application for patent filed August 26, 1994.

Appeal No. 1997-1885
Application No. 08/296,671

This is a decision on the appeal under 35 U.S.C. § 134 from the examiner's rejection of claims 1-12, 14, 23 and 24, which constitute all the claims remaining in the application. Four amendments after final rejection were filed in this application. The amendments designated "B" and "D" were not entered by the examiner whereas the amendments designated "C" and "E" have been entered by the examiner.

The disclosed invention pertains to a semiconductor device package.

Representative claim 1 is reproduced as follows:

1. A semiconductor device package, comprising:
 - (a) a metal base having a top surface and a cavity formed in the top surface;
 - (b) a lead frame having a plurality of leads, the lead frame being supported by the top surface of the base;
 - (c) an insulating layer positioned between the lead frame and the top surface of the base, the insulating layer being arranged to electrically insulate the lead frame from the base;
 - (d) an integrated circuit die received within the base cavity and electrically coupled to the lead frame;
 - (e) a plastic cap molded over the top surface of the metal base, the die and an inner portion of lead frame, the cap cooperating with the base to encapsulate the die wherein the plastic cap is in direct contact with the integrated circuit die.

Appeal No. 1997-1885
Application No. 08/296,671

The examiner relies on the following references:

Suzuki et al. (Suzuki) 1987	4,707,724	Nov. 17,
Mahulikar (Mahulikar '292) 1992	5,103,292	Apr. 07,
Mahulikar et al.(Mahulikar '299) 1992	5,155,299	Oct. 13,

Claims 1-12, 14, 23 and 24 stand rejected under 35 U.S.C. § 103. As evidence of obviousness the examiner offers Mahulikar '299 in view of Mahulikar '292 and Suzuki.

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

OPINION

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

Appeal No. 1997-1885
Application No. 08/296,671

It is our view, after consideration of the record before us, that the evidence relied upon and the level of skill in the particular art would have suggested to one of ordinary skill in the art the obviousness of the invention as set forth in claims

1, 4-9 and 11. We reach the opposite conclusion with respect to claims 2, 3, 10, 12, 14, 23 and 24. Accordingly, we affirm-in-part.

Appellants have nominally indicated that the claims do not stand or fall together, but they have not specifically argued the limitations of each of the claims. To the extent that appellants have properly argued the reasons for independent patentability of specific claims, we will consider such claims individually for patentability. To the extent that appellants have made no separate arguments with respect to some of the claims, such claims will stand or fall with the claims from which they depend. Note *In re King*, 801 F.2d 1324, 1325, 231 USPQ 136, 137 (Fed. Cir. 1986); *In re Sernaker*, 702 F.2d 989, 991, 217 USPQ 1, 3 (Fed. Cir. 1983).

Appeal No. 1997-1885
Application No. 08/296,671

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. 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

Appeal No. 1997-1885
Application No. 08/296,671

Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). If that burden is met, the burden then shifts to the applicant to overcome the prima facie case with argument and/or evidence. Obviousness is then determined on the basis of the evidence as a whole and the relative persuasiveness of the arguments. See Id.; In re Hedges, 783 F.2d 1038, 1039, 228 USPQ 685, 686 (Fed. Cir. 1986); In re Piasecki, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984); and In re Rinehart, 531 F.2d 1048, 1052, 189 USPQ 143, 147 (CCPA 1976). Only those arguments actually made by appellants have been considered in this decision. Arguments which appellants could have made but chose not to make in the briefs have not been considered [see 37 CFR § 1.192(a)].

With respect to all of the claims on appeal, the examiner cites Mahulikar '299 as teaching a semiconductor device of the type claimed wherein the integrated circuit is packaged between a metal base and a metal cap. Mahulikar '292 is cited as teaching a similar package in which a plastic cap is used instead of the metal cap. This combination does not teach the plastic cap being in direct contact with the integrated circuit die. The examiner cites Suzuki as teaching

Appeal No. 1997-1885
Application No. 08/296,671

a semiconductor device package in which the elements of the device are encapsulated in a molded, plastic package. The examiner explains the basis for his conclusion that the invention of each of the appealed claims would have been obvious within the meaning of 35 U.S.C. § 103 [answer, pages 4-5].

Appellants have directed their arguments in the briefs to four different features of the claimed invention. These features are the molded cap feature, the stepped lead frame feature, the lead frame size features, and the package size features. The only one of these features included in independent claim 1 is the molded cap feature.

Appellants argue that the recitation of a "plastic cap molded over the top surface of the metal base, the die and an inner portion of lead frame" precludes a preformed plastic cap and requires instead that the plastic cap be formed *in situ* as a molding operation. Appellants note that Mahulikar '299 and Mahulikar '292 clearly use preformed caps to cover and encapsulate the integrated circuit die. Although the Suzuki package uses an *in situ* plastic molding operation to create package 7, appellants argue that Suzuki does not teach a metal

Appeal No. 1997-1885
Application No. 08/296,671

base with a plastic cap [brief, pages 3-4]. The examiner has viewed the molding limitation of claim 1 as a process limitation which does not distinguish over the prior art product [answer, pages 6-7]. Appellants respond that the recitation "molded over" requires a specific structural relationship that is not suggested by the applied prior art [reply brief].

Although the examiner was incorrect to label claim 1 a product-by-process claim, the examiner, nevertheless, reached the correct result when the collective teachings of the applied references are considered. Appellants' arguments attack the references individually instead of considering the teachings collectively as applied by the examiner. We view the rejection as proposing to replace the cap or cover portion only of the Mahulikar combination with an equivalent molded plastic as taught by Suzuki or as shown in appellants' prior art Figure 1.

The molded plastic cover of Suzuki and the two piece package having a base plate and a cap as taught by either Mahulikar were known to the artisan as providing similar protection for integrated circuit dies. Appellants refer to

Appeal No. 1997-1885
Application No. 08/296,671

molded plastic as the background or prior art for their invention. Likewise, Mahulikar '299 describes such plastic packages as a background to his disclosure of the two piece package [column 1]. Thus, we find that the artisan would clearly have been familiar with both the molded plastic package and the two-piece package and the fact that they are both used to protect the manufacture of integrated circuit dies.

If the artisan chose to make the top cover of the Mahulikar combination using the molded plastic technique of Suzuki as proposed by the examiner, the limitations of clause (e) of claim 1 would be satisfied. That is, the Suzuki method of forming a plastic cover would result in the plastic being molded over all the exposed portions of the metal base and die of the Mahulikar combination which would result in the plastic cover being in direct contact with the die.

Appellants' arguments do not address the obviousness of combining the teachings of Suzuki with the Mahulikar combination. Appellants dismiss each Mahulikar patent as not having the claimed plastic cap molded over the metal base, and appellants dismiss Suzuki as not having a plastic cap and a

Appeal No. 1997-1885
Application No. 08/296,671

metal base [brief, page 4]. Yet, we view the combination of teachings of the three references as suggesting that the cover of the Mahulikar combination be created by a molding process as taught by Suzuki. As noted above, this combination would meet the language of claim 1, and appellants have not properly argued the nonobviousness of the invention over this collective teaching of these references.

In view of the above comments, we sustain the examiner's rejection of claim 1 under 35 U.S.C. § 103. Since claims 4-9 and 11 depend from claim 1 and contain only the argued molded cap feature, these claims fall with claim 1.

With respect to the stepped lead frame feature, the examiner refers to the plating on the Suzuki lead frame as meeting this limitation of the claims. Appellants argue that the solder plating of Suzuki cannot be considered to meet the recitation of the lead frame as recited in the claims, and the basis for applying the solder plating in Suzuki would provide no similar benefit to the Mahulikar combination [brief, pages 6-7].

We agree with the position of appellants.

Appeal No. 1997-1885
Application No. 08/296,671

We find no suggestion in Suzuki for making the lead frame of the Mahulikar combination of two thicknesses as recited in the claims. The examiner's reading of Suzuki is inconsistent with the claim language and the teachings of the reference. The stepped lead frame feature appears in claims 2, 3, 12, 14, 23 and 24. Therefore, we do not sustain the examiner's rejection with respect to these claims.

Appellants' remaining arguments are directed to the lead frame size features and the package size features. The examiner dismisses the claimed size limitations as obvious design choices. Appellants argue that there is no suggestion within the applied prior art that the size limitations recited in the claims are suggested or achievable. Again, we agree with appellants.

There is absolutely no suggestion in the Mahulikar patents that the packages produced therein can be made to fall within the claimed range. The examiner's mere statement that it would have been obvious to make integrated circuit packages as small as possible cannot form the required evidence of obviousness. The Mahulikar packages may already be as small as possible and still fail to meet the size limitations of the

Appeal No. 1997-1885
Application No. 08/296,671

claims. The rejection is based on pure speculation. This size limitation applies to claim 10. Therefore, we do not sustain the rejection of claim 10.

In conclusion, we have decided the obviousness of the molded cap feature adversely to appellants, but we have decided the obviousness of the other three features in favor of appellants. This decision results in our sustaining the rejection of claims 1, 4-9 and 11, but not sustaining the rejection of claims 2, 3, 10, 12, 14, 23 and 24. Accordingly, the decision of the examiner rejecting claims 1-12, 14, 23 and 24 is affirmed-in-part.

Appeal No. 1997-1885
Application No. 08/296,671

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

AFFIRMED-IN-PART

JERRY SMITH)	
Administrative Patent Judge)	
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ERIC FRAHM)	BOARD OF PATENT
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Appeal No. 1997-1885
Application No. 08/296,671

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