Paper No. 27

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MANNY KIN F. MA
and JEFFREY D. BRUCE

Appeal No. 2001-1449
Application No. 08/791,177

ON BRIEF

Before JERRY SMITH, BLANKENSHIP, and SAADAT, Administrative Patent Judges.

JERRY SMITH, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on the appeal under 35 U.S.C. § 134 from the examiner's rejection of claims 20-38 and 41, which constitute all the claims remaining in the application. An amendment after final rejection was filed on February 28, 2000 and was entered by the examiner.

The disclosed invention pertains to a method of upgrading, adapting, modifying or remediating a primary semiconductor die using a patch die in a piggyback configuration to achieve the upgrade, adaptation, modification or remediation of the primary die.

Representative claim 20 is reproduced as follows:

20. A method of assembling a semiconductor die device comprising:

providing a primary die exhibiting at least one electrical or operational characteristic;

mounting at least one patch die on said primary die for altering said at least one electrical or operational characteristic of said primary die; and

forming an electrical contact between said at least one patch die and said primary die.

The examiner relies on the following references:

Takiar et al. (Takiar)	5,422,435	June 6, 1995
Tsubouchi	JP 56-158467	Dec. 7, 1981

Claims 20-38 and 41 stand rejected under 35 U.S.C. § 103. As evidence of obviousness the examiner offers Takiar in view of Tsubouchi.

Rather than repeat the arguments of appellants or the examiner, we make reference to the briefs and the answer 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 answer.

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 20-31, 33-38 and 41. We reach the opposite conclusion with respect to claim 32. Accordingly, we affirm-in-part.

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 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 brief have not been considered and are deemed to be waived by appellants [see 37 CFR § 1.192(a)].

We consider first the rejection with respect to claims 20-22, 24-26, 28-30, 35-38 and 41 which stand and fall together as a single group [brief, page 13]. We select independent claim 20 as the representative claim for this group. With respect to claim 20, the examiner cites Takiar as teaching the mounting of a secondary die on a primary die. The examiner finds that the secondary die of Takiar alters an electrical characteristic of the primary die. Although the examiner cites Tsubouchi as teaching the formation at least one electrical connection between a first contact region of the first element and a second element back surface contact region, it is not clear why this

teaching is necessary to support the rejection of claim 20 since claim 20 simply recites forming an electrical contact between the patch die and the primary die [answer, pages 3-5].

Appellants argue that Takiar does not teach or suggest that a second die be mounted to a first die for upgrading, modifying, altering or remediating an electrical or operational characteristic of the first die. Appellants note that Tsubouchi also fails to provide this teaching. Appellants dispute the examiner's findings and argue that the examiner has not identified any teaching in Takiar to support the examiner's position. Appellants argue that the examiner is relying on an inherency argument and that the inherency argument is not supported by the record [brief, pages 13-20].

The examiner responds that Takiar teaches that the primary die and the patch die are electrically connected. The examiner asserts that when electrical signals travel between dies, electrical characteristics of the die leads are inherently altered [answer, page 6]. Appellants respond that the examiner has still failed to point to any portion of Takiar which supports his position [reply brief, pages 2-8].

We will sustain the examiner's rejection of representative claim 20. At the outset we must determine the scope of claim 20. The critical phrase is the recitation "for altering said at least one electrical or operational characteristic of said primary die." Appellants frequently argue that Takiar does not teach or suggest "a second die be mounted to a first die for upgrading, modifying, altering, or remediating an electrical or

operational characteristic of the first die" [brief, page 15, bottom of page]. The quoted portion of appellants' argument is clearly unrelated to the actual recitation of claim 20. Thus, appellants' arguments are frequently directed to an invention which has not been claimed. Appellants seem to be arguing the disclosed invention in which remediation is the key feature of the invention. Note that remediation is specifically defined on page 7 of the specification but does not appear in representative claim 20. For purposes of applying prior art against claim 1, no teaching of remediation is required.

The examiner has broadly interpreted the phrase "altering said at least one electrical or operational characteristic of said primary die" as being "altering an electrical characteristic of said primary die." In other words, the examiner finds that a prior art reference must only teach or suggest that an electrical characteristic of the primary die is altered. We agree that this is the correct interpretation of the phrase in claim 20 for applying prior art against the claim. Unfortunately, the examiner has not further specifically indicated how he interprets this phrase. It does appear, however, that the examiner interprets an electrical characteristic of the primary die as being met by a voltage level at a bonding pad of the primary die. It appears to be the position of the examiner that when signals are exchanged between the patch die and the primary die using a bonding pad of the primary die, the voltage levels of the bonding pad are altered to reflect this connection. We agree with this finding of the examiner. For example, if the connection point is an input/output port between the two dies, the

voltage level at the port would be altered to indicate the presence or absence of a signal from the patch die to the primary die.

Notwithstanding appellants' argument that this finding is improperly based on inherency, we agree with the examiner that when an electrical characteristic is broadly defined to be nothing more than a voltage level at a connection point, then the artisan would have recognized that the voltage level at this connection point would be altered based on the presence or absence of signals at this connection point. Therefore, when giving representative claim 20 its broadest reasonable interpretation, we agree with the examiner that the collective teachings of Takiar and Tsubouchi would have suggested the claimed invention to the artisan. Since we sustain the rejection of claim 20, we also sustain the rejection of claims 21, 22, 24-26, 28-30, 35-38 and 41 which are grouped therewith.

We now consider the rejection with respect to claims 23, 27 and 31 which stand or fall together [brief, page 13]. These claims recite that an electrical connection between the primary die and the patch die uses a TAB connection. Appellants argue that Takiar teaches against using a TAB connection because TAB connections are complex and expensive [brief, pages 20-22]. The examiner responds that Takiar teaches that TAB connections are conventional. The examiner notes that the fact that TAB connections are complex and expensive does not render such connections as being non-obvious to the artisan [answer, page 7].

We agree with the examiner for the reasons given in the answer. The fact that Takiar recognizes that TAB connections could be used although they are complex and expensive teaches the obviousness of TAB connections within the meaning of 35 U.S.C. § 103. Therefore, we sustain the rejection of claims 23, 27 and 31.

We now consider the rejection with respect to claim 32. Appellants argue that neither Takiar nor Tsubouchi teaches the direct attachment of a lead finger of an LOC-configured lead frame to a bond pad on a semiconductor die [brief, pages 22-23]. The examiner responds that Takiar teaches that TAB connections are conventional. The examiner notes that a TAB connection would meet the recitations of claim 32 [answer, page 7]. Appellants respond that the examiner has not considered all the limitations of claim 32. Specifically, appellants argue that a TAB connection is not a lead finger of a leadframe that extends over a surface of a patch die and that is directly attached to a bond pad on the face surface of the patch die [reply brief, pages 8-9].

We agree with appellants for reasons given in the reply brief. The fact that Takiar recognizes that TAB connections could be used does not teach or suggest the obviousness of extending and attaching the lead finger as claimed. The examiner has not indicated where the specific recitations of claim 32 are found in the applied prior art. Therefore, we will not sustain the rejection of claim 32.

We now consider the rejection with respect to claims 33 and 34 which stand or fall together [brief, page 13]. Appellants argue that the examiner has provided no

motivation or suggestion for combining the teachings of Takiar and Tsubouchi. Specifically, appellants argue that combining the teachings of Takiar and Tsubouchi does not advance the purposes of either Takiar or Tsubouchi [brief, pages 23-27]. The examiner responds that Tsubouchi was cited only to teach that flip-chip bonding was conventional. The examiner notes that the fact that flip-chip bonding and solder ball connections are complex and expensive does not render such connections as being non-obvious to the artisan [answer, pages 7-8].

We agree with the examiner for the reasons given in the answer. The fact that Takiar recognizes that flip-chip connections have been used although they are complex and expensive teaches the obviousness of flip-chip connections using solder balls within the meaning of 35 U.S.C. § 103. Therefore, we sustain the rejection of claims 33 and 34.

In summary, we have sustained the examiner's rejection with respect to claims 20-31, 33-38 and 41, but we have not sustained the examiner's rejection with respect to claim 32. Accordingly, the decision of the examiner rejecting claims 20-38 and 41 is affirmed-in-part.

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	)))))) BOARD OF PATENT) APPEALS) AND) INTERFERENCES))))
HOWARD B. BLANKENSHIP Administrative Patent Judge	
MAHSHID SAADAT Administrative Patent Judge	

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