

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 16

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte LAVOIE R. MILLICAN and
VERN H. WINCHELL II

Appeal No. 96-0410
Application 08/161,015¹

ON BRIEF

Before THOMAS, KRASS and BARRETT, Administrative Patent Judges.

THOMAS, Administrative Patent Judge.

DECISION ON APPEAL

Appellants have appealed to the Board from the examiner's

¹ Application for patent filed December 3, 1993.

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final rejection of claims 1 to 8 and 10 to 17, which constitute all the claims remaining in the application.

Claim 1 is reproduced below:

1. A method of testing an integrated circuit die, comprising the steps of:

disposing flat solder pads on the integrated circuit die;

probing said flat solder pads to perform an electrical test on the integrated circuit die before a reflow solder process; and

reflowing said flat solder pads following said probing step to transform said solder pads into rounded solder bumps.

The following references are relied on by the examiner:

Mones et al. (Mones)	4,273,859	June 16, 1981
Temple et al. (Temple)	4,814,283	Mar. 21, 1989
LeParquier et al. (LeParquier)	5,002,895	Mar. 26, 1991
Koopman et al. (Koopman)	5,289,631	Mar. 01, 1994

(Filed Mar. 4, 1992)

All claims on appeal stand rejected under 35 U.S.C. § 103. As evidence of obviousness, the examiner relies upon LeParquier in view of Koopman and Mones as to claims 1 to 3 and 10 to 12, with the addition of Temple as to claims 4 to 8 and 13 to 17.

Rather than repeat the positions of the appellants and the examiner, reference is made to the brief and the answer for the respective details thereof.

OPINION

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We reverse the outstanding rejections of all the claims on appeal.

It appears that the examiner has not come to grips with the requirement of the first stated step of independent claim 1 on appeal, that of disposing "flat solder pads" on the integrated circuit. We find that no reference relied upon by the examiner in the first stated rejection teaches such a feature, notwithstanding the examiner's attempt to reformulate the assessment of the prior art at page 5 of the answer.

LeParquier's integrated circuit component connection pads P in his prior art Figs. 1 to 3 are not stated in the reference to be flat solder pads as required by independent claim 1 on appeal. The discussion at the top of col. 3 of the reference indicates that a separate solder projection or bump 1 is formed on this pad P, as depicted in prior art Fig. 2 of LeParquier, both of which appear in this figure to maintain their separate physical integrity. Therefore, the formation of the solder bump 1 does not appear to occur from any solder already present in the pad P on the chip IC. Collectively taken, however, the combination of the solder bump 1 and the pad P may be considered a solder pad but it is not stated to be flat and it is not probed directly, whereas the probing actually occurs on the tape 4 at tape testing

pads 5 in Figs. 1 and 2. LeParquier's contribution in the art depicted in Figs. 4 through 6 appears to use welding rather than soldering.

Continuing on the same points, the barrier metal layer 24 in Fig. 2 of Mones may be considered to be a flat pad on an integrated circuit substrate, but again there is no flat solder pad that is formed before the solder bump 28 as depicted in Fig. 3 of this reference. There is no testing in Mones. Finally Koopman's figures show the formation of a solder bump 15 on the integrated circuit chip 11 in the Fig. 1 series of figures.

As to the feature of the claims requiring flat solder pads, appellants' own admitted prior art appears to have been a better starting point than any of the references relied upon by the examiner. Indeed, except for the feature of independent claim 1 of probing a flat solder pad directly before reflowing the solder, the other features of this claim appear to have been known in appellants' admitted prior art.

The real question is still as correctly identified by the examiner that the order of the steps was critical to an understanding of the claimed invention, as expressed by the examiner at the top of page 6 of the answer. However, we disagree with the examiner's conclusion that Koopman teaches that

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the claimed order of the steps is taught or suggested by this reference. Koopman clearly teaches probing before a reflow solder process, which reflow solder process may be an option according to the showing in Fig. 1E and the teaching at col. 8, lines 15 through 19 as identified by the examiner in the answer. Again, there is no starting point of flat solder pads in this or in any other reference relied upon before the reflow solder process and there is no teaching or suggestion of probing flat solders pads with an electrical test instrument as also required by this claim.

Finally, even if we were to consider appellants' background of the invention at pages 1 and 2 of the specification as filed as part of the reasoning process of the outstanding rejection under 35 U.S.C. § 103 in addition to the prior art relied upon to LeParquier, Koopman and Mones according to the examiner's statement of the rejection, we do not end up with the reordering of the prior art approach which is the formation of solder bumps, testing the bumps and than executing a reflow process. Stated differently, even considering these three references as applied along with the prior art approach expressed by appellants in pages 1 and 2 of the specification as filed, the artisan would have not been led to have reordered the prior art process to

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arrive at the claimed invention of first testing with electrical test probing instruments flat solder pads and than reflowing the tested or probed flat solder pads to form solder bumps.

Since independent claim 10 is more detailed than the similar requirements of independent claim 1 on appeal, the rejection of this claim must also be reversed. As such, the rejection of dependent claims 2 and 3 and 11 and 12 must be reversed, as well as the remaining dependent claims, further relying upon Temple. Therefore, the decision of the examiner rejecting claims 1 to 8 and 10 to 17 under 35 U.S.C. § 103 is reversed.

REVERSED

JAMES D. THOMAS

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Administrative Patent Judge)	
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)	BOARD OF PATENT
ERROL A. KRASS)	
Administrative Patent Judge)	APPEALS AND
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)	INTERFERENCES
)	
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