

The opinion in support of the decision being entered today was **not** written for publication and is **not** binding precedent of the Board.

Paper No. 25

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte LARRY D. KINSMAN, TIMOTHY J. ALLEN, and JERRY M. BROOKS

Appeal No. 1999-2570
Application No. 08/923,218

ON BRIEF

Before KRASS, DIXON, and GROSS, **Administrative Patent Judges**.
DIXON, **Administrative Patent Judge**.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1, 3, 4, 6-10, 31-34, and 36-40. Claims 18-30 and 48-70 are withdrawn from consideration as drawn to a non-elected invention. Claims 2, 5, 11-17, 35 and 41-47 have been canceled.

We REVERSE.

BACKGROUND

The appellants' invention relates to a stress reduction feature for 2 leads-over-chip (LOC) configuration lead frame. The invention provides an enlarged space between the lower surface of the lead and the active surface of the semiconductor to provide stress relief and flow of filler material therein. An understanding of the invention can be derived from a reading of exemplary claim 1, which is reproduced below.

1. A semiconductor die assembly encapsulated in plastic having filler material therein having a particle size distribution and an average particle size diameter within the particle size distribution during an encapsulation process in a mold, said die assembly comprising:

a semiconductor die having an active surface and a plurality of sides;

at least one adhesive segment having an outer edge and adhering to a portion of said active surface of said semiconductor die; and

a lead frame including a plurality of lead members, at least one lead member of the plurality of lead members having a lead end portion connected to a portion of the lead frame, having a length, having a thickness, and having a free end portion extending over a portion of said active surface of said die, said at least one lead member including a stress relief portion formed in said at least one lead member of said plurality of lead members, said stress relief portion extending over a portion of said active surface of said die, extending along a portion of the length of said at least one lead member at a location between said free end portion and said lead end portion and extending partially through the thickness of said at least one lead member, said stress relief portion formed in said at least one lead member extending along the length of the at least one lead member from a location proximate the outer edge of said at least one adhesive segment to a location proximate a side of said plurality of sides of said semiconductor die, said stress relief portion providing an enlarged space between a lower surface of said at least one lead member and a portion of the active surface of said semiconductor die,

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said enlarged space allowing said plastic having said filler material therein having said particle size distribution and said average particle size diameter within the particle size distribution to flow therethrough without said filler material therein substantially damaging said portion of said active surface of said semiconductor die during said encapsulation process of encapsulating said semiconductor device in said plastic having said filler material therein.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Burns	4,209,355	Jun. 24, 1980
Murakami et al. (Murakami)	5,068,712	Nov. 26, 1991

Claims 1,3,4,6-10, 31-34, and 36-40 stand rejected under 35 U.S.C. § 103 as being unpatentable over Murakami in view of Burns.

Rather than reiterate the conflicting viewpoints advanced by the examiner and the appellants regarding the above-noted rejections, we make reference to the examiner's answer (Paper No. 22, mailed Jan. 6, 1999) for the examiner's reasoning in support of the rejections, and to the appellants' brief (Paper No. 21, filed Nov. 12, 1998) and reply brief (Paper No. 23, filed Mar. 3, 1999) for the appellants' arguments thereagainst.

OPINION

In reaching our decision in this appeal, we have given careful consideration to the appellants' specification and claims, to the applied prior art references, and to the

respective positions articulated by the appellants and the examiner. As a consequence of our review, we make the determinations which follow.

Appellants argue that the examiner has not established a *prima facie* case of obviousness. (See brief at page 6.) Appellants argue that neither reference suggests the combination of teachings. (See brief at page 6.) We agree with appellants. Appellants argue that the examiner used impermissible hindsight in an attempt to reconstruct the claimed invention. (See brief at page 6.) Again, we agree with appellants. Appellants argue that the prior art references do not recognize the problem of preventing damage to the surface of the semiconductor by the filler material in the molding resin during the molding process and providing a stress relief portion in the lead to prevent damage. (See brief at page 7.) Again, we agree with appellants.

Appellants argue the differences between the shape and size of the filler material at page 8 of the brief, but we find no such limitation in the language of the independent claims. Therefore, this argument is not persuasive.

Appellants argue that Murakami does not teach or suggest stress reduction to prevent damage to the active surface of the semiconductor device. (See brief at page 8.) We agree with appellants. Appellants argue that Murakami does not teach or suggest the use of a reduced thickness portion of a lead of a lead frame for any purpose. (See brief at page 9.) We agree with appellants. Appellants argue that the Burns reference does teach

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a reduced thickness portion which is etched to form bumps, but these bumps are for better thermocompression bonding of bumps to bond pads in a taped automated bonding system. (See brief at page 10.) We agree with appellants. Appellants argue that the combination of Murakami and Burns does not establish a *prima facie* case of obviousness concerning the stress relief portion of the lead. (See brief at page 12.) We agree with appellants. The examiner maintains that the particle size and capacitance would have motivated the use of a stress relief portion of the lead. (See answer at pages 4-5.) We find that the examiner's analysis is merely speculation and analysis in light of appellants' disclosure of the problem and solution. Therefore, we are not persuaded by the examiner's argument with respect to the teachings of Murakami concerning stress relief. Therefore, we will not sustain the rejection of independent claims 1, 3, 31, and 33 and their dependent claims which all contain similar limitations.

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CONCLUSION

To summarize, the decision of the examiner to reject claims 1, 3, 4, 6-10, 31-34, and 36-40 under 35 U.S.C. § 103 is reversed.

REVERSED

ERROL A. KRASS)	
Administrative Patent Judge)	
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)	
)	
)	BOARD OF PATENT
JOSEPH L. DIXON)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
)	
)	
)	
ANITA PELLMAN GROSS)	
Administrative Patent Judge)	

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