

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 19

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte BRANT P. BRAEGES
and DAVID A. RICH

Appeal No. 2000-1517
Application 08/850,470

ON BRIEF

Before MCQUADE, NASE, and CRAWFORD, Administrative Patent Judges.

MCQUADE, Administrative Patent Judge.

DECISION ON APPEAL

Brant P. Braeges et al. appeal from the final rejection of claims 1 through 7, all of the claims pending in the application.¹

THE INVENTION

¹ Claim 1 has been amended subsequent to final rejection.

The invention relates to an electronic and/or optical package assembly which is defined in representative claim 1 as follows:

1. A package assembly comprising an electronic and/or an optical component mounted on a circuit board, both said circuit board and said electronic and/or optical component being sealed to a housing, said housing having a hole therethrough to provide access to said electronic and/or optical component and being filled with an organic polymer encapsulating material that is cured in place, said electronic and/or optical component being sealed to said housing around said access hole by sealing material surrounding said access hole to prevent flow of said encapsulating material therethrough during curing thereof, the improvement comprising an integral sealing member having an aperture therethrough in alignment with said access hole to seal said electronic and/or optical component to said housing, said integral sealing member exhibiting the following mechanical, physical, and thermal characteristics:

(a) it can withstand temperatures ranging from -65°C up to 155°C;

(b) it can be readily die cut, punched, or otherwise shaped;

(c) it exhibits low durometer/low shear stress;

(d) it exhibits adhesive tack at ambient temperature;

(e) it maintains sufficient fluid resistance during the curing procedure for said encapsulating material to prevent leakage of said encapsulating material; and

(f) it is essentially a semi-solid, jelly-like substance which demonstrates sufficient structural integrity such that it does not creep or flow during fabrication of said package assembly.²

THE EVIDENCE

² The underlying specification indicates that the recitation of the "integral sealing member" further defines the preceding recitation of the "sealing material."

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The references relied on by the examiner as evidence of obviousness are:

Whalley et al. (Whalley)	5,037,779	Aug. 6,
1991		
Yamaguchi	5,604,372	Feb. 18,
1997		

THE REJECTIONS

Claims 1 through 7 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Whalley in view of Yamaguchi.

Attention is directed to the appellants' brief (Paper No. 15) and to the examiner's answer (Paper No. 16) for the respective positions of the appellants and the examiner with regard to the merits of this rejection.³

DISCUSSION

³ In the final rejection (Paper No. 10), claims 1 through 7 also stood rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. The examiner has since withdrawn this rejection as a result of the amendment of claim 1 subsequent to final rejection (see the advisory action dated September 15, 1999, Paper No. 13).

Whalley discloses a method of encapsulating an electronic or optical device wherein a selected sensitive region of the device is left uncovered (see column 1, lines 21 through 32). The device 1 is mounted on a substrate 2 and wire bonded at 3 and 4 to conductive tracks 5 and 6 on the substrate. In certain embodiments (see Figures 2 through 5, 7 and 8), a sheet 9 of transparent material having a hole 10 is located over the device with the hole 10 aligned with the sensitive region 11. The sheet is spaced from the device to prevent it from pressing the wires 3 and 4 into short-circuiting contact with the device. A spacer 15, which can be configured as posts, isolated ridges or a ridge surrounding the hole 10 (see column 3, lines 26 through 58), may be formed on the device (Figure 7) or on the sheet (Figure 8). Capillary action is employed to draw an encapsulating material over the device except for the sensitive region 11.

In comparing Whalley to the subject matter recited in claim 1 (see page 4 in the answer), the examiner likens Whalley's spacer 15 to the sealing material/member recited in the claim, but notes that Whalley does not disclose spacer 15

as being made of silicone. By this, the examiner presumably means that the spacer 15 does not have the mechanical, physical and thermal characteristics specified in the claim.⁴

Yamaguchi discloses a pressure sensor apparatus comprising a semiconductor pressure sensing element 1, a stem 8, bonding wires 3, signal lines 10 and a resin encapsulation portion 2, these elements being arranged as shown in Figures 1 and 2. The apparatus also includes a stopper ring 7 of elastic silicone resin formed on the stem 8 for sealing against an opposing mold surface to prevent leakage of the encapsulating resin onto a portion of the stem intended to be welded to a metal package 20 (see Figure 7).

In proposing to combine Whalley and Yamaguchi, the examiner concludes that

it would have been obvious to one of ordinary skill in [the] art of semiconductors at the time the invention was made to have used the encapsulant leakage stopper (integral sealing member) as taught

⁴ In the paragraph bridging pages 5 and 6 of their specification, the appellants describe two commercially available products, GELTEK® and KERATHERM®, which are prepared from silicones and/or fluorosilicones and embody the mechanical, physical and thermal characteristics set forth in claim 1.

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by Yamaguchi in the Whalley et al device to prevent the encapsulant from flowing to regions of the electronic equipment that need to be left exposed. Furthermore, since the applicant [sic] discloses that the material of the integral sealing member is a silicone . . . which meets the limitations of lines 11-19 [in claim 1 setting forth the mechanical, physical and thermal characteristics of the sealing member], it will therefore be tantamount to conclude that the silicone material disclosed in the Yamaguchi device meets the same limitations [answer, pages 4 and 5].

As persuasively argued by the appellants, however, the examiner's analysis is fundamentally flawed in at least three areas.

To begin with, the examiner's finding that Whalley's spacer 15 constitutes a sealing material/member which seals a component (device 1) to its housing (sheet 9) around an access hole (hole 10) to prevent flow of encapsulating material therethrough as recited in claim 1 has no factual support in the Whalley reference. The flow of Whalley's encapsulating material is controlled by capillary action. There is nothing in the reference which indicates that the spacer 15 seals the device 1 to the sheet 9, or is even capable of doing so, to prevent the flow of encapsulating material through the hole 10.

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Moreover, since the proposed combination of Whalley and Yamaguchi rests on the examiner's unfounded characterization of Whalley's spacer 15 as a sealing material/member, it too is unsound. Simply put, there is nothing in the disparate teachings of these two references which would have suggested replacing Whalley's spacer 15 with an elastic silicone resin stopper ring of the sort 7 disclosed by Yamaguchi.

Finally, even if the proposed modification of Whalley in view of Yamaguchi were made, there is nothing in Yamaguchi's disclosure of the elastic silicone resin stopper ring 7 to indicate that it possesses the mechanical, physical and thermal characteristics specified in claim 1. The examiner's apparent assumption that all silicones embody such characteristics is completely unfounded.

Hence, the combined teachings of Whalley and Yamaguchi do not justify the examiner's conclusion that the differences between the subject matter recited in claim 1 and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art. Accordingly, we shall not sustain

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the standing 35 U.S.C. § 103(a) rejection of claim 1, or of
claims 2 through 7 which depend therefrom, as being
unpatentable over Whalley in view of Yamaguchi.

SUMMARY

The decision of the examiner to reject claims 1 through 7
is reversed.

REVERSED

JOHN P. MCQUADE)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
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)	APPEALS AND
JEFFREY V. NASE)	
Administrative Patent Judge)	INTERFERENCES
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MURRIEL E. CRAWFORD)	
Administrative Patent Judge)	

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