

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ATSUHITO HAYAKAWA
and
YASUYUKI MURATA

Appeal No. 2006-0977
Application 10/250,605

ON BRIEF

Before KIMLIN, GARRIS, and KRATZ, Administrative Patent Judges.

KIMLIN, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 1, 3-5 and 7-9. A copy of illustrative claim 1 is appended to this decision.

The examiner relies upon the following references as evidence of obviousness:

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Igarashi et al. (Igarashi) (Japanese Patent Abstract)	05-067702	Mar. 19, 1993
Yamaguchi et al. (Yamaguchi) (Japanese Patent Abstract)	06-145306	May 24, 1994
Fujii et al. (Fujii) (Japanese Patent Abstract)	11-269349	Oct. 5, 1999

Appellants' claimed invention is directed to an epoxy resin composition that finds utility in semiconductor encapsulation. The composition comprises a biphenol epoxy resin of the recited formula, a thiodiphenol compound of the claimed formula (II), a polyhydric phenol, an inorganic filler and a curing accelerator.

Appealed claims 1, 3-5, and 7-9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Japanese '306 in view of Japanese '349. Claims 1, 3-5, and 7-9 also stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Japanese '349 in view of Japanese '702 and Japanese '306.

Appellants admit at page 3 of the brief that "[t]he claims 1, 3-5, and 7-9 stand or fall together." Accordingly, all the appealed claims stand or fall together with claim 1.

We have thoroughly reviewed each of appellants' arguments for patentability. However, we are in complete agreement with the examiner's reasoned analysis and application of the prior art, as well as his cogent and thorough disposition of the arguments raised

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by appellants. Accordingly, we will adopt the examiner's reasoning as our own in sustaining the rejections of record, and we add the following for emphasis only.

There is no dispute that Japanese '306, like appellants, discloses an epoxy resin composition for semiconductor encapsulation which comprises a biphenol epoxy resin, a hardener blend of a phenol hardener and a thiodiphenol hardener, such as bis(4-hydroxyphenyl) sulfide recited in appellants' claim 5, a polyhydric phenol like the claimed phenol aralkyl resin, an inorganic filler and a curing accelerator. The only deficiency of Japanese '306 with respect to the components of the claimed epoxy resin composition is that the reference does not expressly disclose the claimed 3,3',5,5'-tetramethyl-4,4'-biphenol epoxy resin. However, as acknowledged by appellants, Japanese '306 "states that all epoxy resins may be used in its composition and lists several examples which include '... a bis-hydroxy biphenyl, its alkylation object'" (page 4 of brief, last paragraph). Accordingly, since Japanese '349 admittedly discloses an epoxy resin composition for semiconductor encapsulation that includes the presently claimed 3,3',5,5'-tetramethyl-4,4'-biphenol epoxy resin, we have no doubt that one of ordinary skill in the art would have found it obvious to select the particular biphenol epoxy resin disclosed by Japanese '349 as the biphenol epoxy resin for the

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composition of Japanese '306. The motivation for such a selection arises from both the teaching in Japanese '306 that all epoxy resins may be used and the disclosure in Japanese '349 that the claimed epoxy resin lowers "the viscosity of the composition to provide higher filler loadings leading to improved reflow crack resistance and moisture resistance" (page 4 of answer, second paragraph).

Appellants point to specification data for demonstrating that the composition of the present invention is flame retardant in the absence of conventional flame retardant additives and that "the compositions provide a good balance of moldability and solder crack resistance" (page 4 of brief, first paragraph). In particular, appellants cite Example 2 and Comparative Example A for demonstrating that the presence of the thiophenol provides "the favorable combination of both flame retardancy and solder crack resistance" (page 4 of brief, second paragraph).

We agree with the examiner that the specification data does not address the thrust of the examiner's rejection inasmuch as the epoxy resin encapsulating composition of Japanese '306 contains the thiophenol which appellants assert is responsible for the favorable combination of properties. Hence, the specification data does not

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represent a comparison with the closest prior art¹, and it is reasonable to conclude that the epoxy resin composition fairly taught by Japanese '306 which comprise the claimed thiophenol would also exhibit the same properties. Lacking in the specification data argued by appellants is a meaningful comparison between compositions fairly taught by Japanese '306 and epoxy resin compositions comprising biphenol epoxy resins within the scope of the appealed claims.

Also, appellants have not refuted the examiner's statement that "nowhere in the specification or examples is there any corroboration of the allegation that it is the combination of the thiodiphenol and tetramethylbiphenol epoxy resin that imparts moldability, solder crack resistance and flame retardancy [and that] [t]he instant specification on page 3, lines 6-8 attributes only low moisture absorption and low stress properties to a biphenol epoxy resin" (page 7 of answer, first paragraph).

Moreover, appellants have not demonstrated that the specification evidence is commensurate in scope with the degree of

¹ In re Johnson, 747 F.2d 1456, 1461, 223 USPQ 1260, 1263-64 (Fed. Cir. 1984).

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protection sought by the appealed claims.² We direct attention to the examiner's discussion at page 10 of the answer, last paragraph.

Also, appellants have not refuted the reasonable criticism lodged by the examiner that "[i]t is unclear whether the moldability and crack resistance is [sic, are] solely a function of the presence of the thiophenol or whether the significantly different types and amounts of polyhydric phenol compound (b-2) materially affects the results" (page 10 of answer, first paragraph). It is well settled that for comparative results to be indicative of non-obviousness they must be truly comparable and not lost in a welter of variables.

To the extent that appellants may have found that the inclusion of the thiophenol in the composition obviates the need for a conventional flame retardant, the examiner properly points out that it is not necessary for a finding of obviousness that the prior art appreciate all the advantages of a known composition, nor is it necessary that one of ordinary skill in the art would have formulated the known or obvious composition for the same reason as appellants.

Appellants also contend that "the composition of JP '349 differs significantly from that of claim 1 of the present application

² In re Grasselli, 713 F.2d 731, 743, 218 USPQ 769-78 (Fed. Cir. 1983).

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requiring, among other things, a cyclopentadiene compound" (page 5 of brief, second paragraph). However, due to the "comprising" language of the appealed claims, the examiner has accurately noted that "[t]he claims do not preclude the presence of other additives such as the cyclopentadienyl metal compound of Japanese '349 which functions as a flame retardant and hardening accelerator (page 5, paragraph 10, lines 1-3)" (page 9 of answer, last paragraph).

The examiner also properly notes that appellants do not separately address the separate rejection of claims 1, 3-5 and 7-9 under § 103 over Japanese '349 in view of Japanese '702 and Japanese '306. (See page 6 of appellants' brief, last paragraph).

In conclusion, based on the foregoing and the reasons well-stated by the examiner, it is our judgment that the evidence of obviousness presented by the examiner outweighs the evidence of non-obviousness proffered by appellants. Accordingly, the examiner's decision rejecting the appealed claims is affirmed.

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No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.36(a)(iv) (effective Sept. 13, 2004; 69 Fed. Reg. 49960 (Aug. 12, 2004); 1286 Off. Gaz. Pat. Office 21 (Sept, 7, 2004)).

AFFIRMED

Edward C. Kimlin)	
Administrative Patent Judge)	
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Bradley R. Garris)	BOARD OF PATENT
Administrative Patent Judge)	APPEALS AND
)	INTERFERENCES
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)	
Peter F. Kratz)	
Administrative Patent Judge)	

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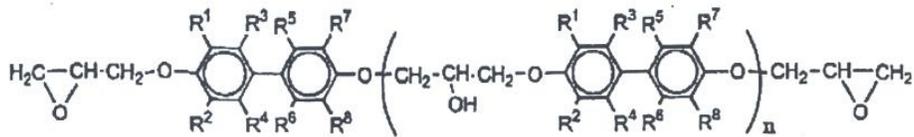
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APPENDIX

1. An epoxy resin composition for semiconductor encapsulation comprising:

(a) a biphenol epoxy resin represented by general formula (I):

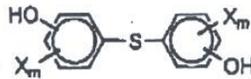


formula (I):

where $R^1=R^2=R^7=R^8=CH_3$, and where $R^3=R^4=R^5=R^6=H$, and n is a number of 0-5 on the average value;

(b) as a phenol hardener,

(b-1) a thiodiphenol compound represented by general formula (II)



formula (II)

in an amount of 1-90% by weight in component (b) where X each may be the same or different and represents an alkyl group having 1-12 carbon atoms, a substituted or unsubstituted phenyl group, a substituted or unsubstituted aralkyl group, or an alkoxy group, and m may each be the same or different and is an integer of 0-3;

(b-2) a polyhydric phenol compound having a structure other than component (b-1) selected from the group consisting of phenol novolak resin, phenol aralkyl resin, terpene phenolic resin, dicyclopentadiene phenolic resin, naphthol novolak resin and combinations thereof, in an amount of 10-99% by weight in component (b);

(c) an inorganic filler in an amount of 75-95% by weight of the entire composition;

and

(d) a curing accelerator.