

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 20

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte HORMAZDYAR M. DALAL,
ALEXIS BITAILLOU, KENNETH M. FALLON, GENE J. GAUDENZI,
KENNETH R. HERMAN, FREDERIC PIERRE, and GEORGES ROBERT

Appeal No. 1998-3033
Application No. 08/794,982

ON BRIEF

Before HAIRSTON, BARRETT, and BLANKENSHIP, Administrative Patent Judges.

HAIRSTON, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection¹ of claims 23 through 39.

¹ A proposed amendment after final rejection (paper number 13) was denied entry by the examiner (paper number 14).

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The disclosed invention relates to an electrical interconnection structure between a first substrate and a second substrate. The interconnection structure comprises at least one eutectic composition formed in the surface of a solder ball located on the first substrate. The eutectic composition is joined to the second substrate via a metal located thereon.

Claim 23 is the only independent claim on appeal, and it reads as follows:

23. An electrical interconnection structure between a first substrate and a second substrate, comprising, a ball limiting metallurgy on said first substrate; a solder ball secured to said ball limiting metallurgy, said solder ball being deformed due to reflow processing; at least one eutectic composition formed in the surface of said deformed solder ball, said eutectic comprising a composition of pure metal and a portion of said solder formed by interaction of a pure metal overlayer and the outer surface of said deformed solder ball contacted by said pure metal overlayer; and a metallurgy on said second substrate securely adhered to said at least one eutectic composition thereby forming said electrical interconnection structure between said first substrate and said second substrate.

The references relied on by the examiner are:

Noll	3,512,051	May
12, 1970		
Best et al. (Best)	3,561,107	Feb. 9,
1971		

Claim 24 stands rejected under the second paragraph of

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35 U.S.C. § 112 as being indefinite.

Claims 23 through 30, 32, 33 and 36 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Noll.

Claims 38 and 39 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Noll or, in the alternative, under 35 U.S.C. § 103(a) as being unpatentable over Noll.

Claims 31, 34, 35 and 37 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Noll in view of Best.

Reference is made to the briefs and the answer for the respective positions of the appellants and the examiner.

OPINION

The indefiniteness rejection is sustained, and the prior art rejections are reversed.

Turning first as we must to the indefiniteness rejection of claim 24, appellants argue (Reply Brief, page 2) that entry of the amendment after final would have placed this claim "in better condition for appeal and for allowance." Other than this argument, appellants have failed to point out the error in the indefiniteness rejection. Accordingly, we will sustain the indefiniteness rejection of claim 24 pro forma.

Turning to the anticipation rejection of claim 23, we agree with the examiner (Answer, page 4) that layer 34 in Noll functions as a ball limiting metallurgy because it limits the size of the solder ball 40, and because it is of the same metal (i.e., chromium) as used by appellants (specification, paragraph bridging pages 3 and 4). We also agree with the examiner (Answer, page 4) that "[i]t is the patentability of the final product which must be determined in a product-by-process claim, and not the patentability of the process." With that in mind, we agree with the examiner (Answer, page 5) that Noll discloses a spherically-shaped² solder ball 40 like the solder ball disclosed by appellants. As stated previously, the method by which the spherically-shaped solder ball is made does not aid in the patentability determination of the product. We likewise agree with the examiner (Answer, page 4) that the claims on appeal recite process steps for forming the at least one eutectic composition. On the other hand, we agree with appellants' arguments (Brief, pages 9, 10 and 13) that Noll does not disclose "at least one eutectic

² Appellants state (specification, page 13, lines 9 and 10) that the solder is "re-flowed to bring it back to its spherical shape."

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composition . . . comprising a composition of pure metal and a portion of said solder." When the solder ball 40 and the thin solder layer 50 on device 10 in Noll are secured to conductive pads 64 on substrate 68, "[t]he solder mass **40** is not affected by this soldering operation" (column 3, lines 40 and 41).

Thus, the 35 U.S.C. § 102(b) rejection of claims 23 through 30, 32, 33 and 36 is reversed because Noll does not form a eutectic composition comprising a pure metal and a portion of solder ball 40. The 35 U.S.C. § 102(b)/35 U.S.C. § 103(a) rejections of claims 38 and 39 are reversed for the same reason.

The 35 U.S.C. § 103(a) rejection of claims 31, 34, 35 and 37 is reversed because Best does not cure the noted shortcoming in the teachings of Noll.

DECISION

With the exception of the indefiniteness rejection of claim 24, all of the rejections are reversed. Accordingly, the decision of the examiner is affirmed-in-part.

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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

	Kenneth W. Hairston)	
	Administrative Patent Judge)	
)	
)	
	Lee E. Barrett)	BOARD OF
PATENT	Administrative Patent Judge)	APPEALS AND
)	INTERFERENCES
)	
	Howard B. Blankenship))
	Administrative Patent Judge)	

KWH:tdl

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