

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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.16

UNITED STATES PATENT AND TRADEMARK OFFICE

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Ex parte ROBERT W. WARREN

Appeal No. 2000-0469
Application No. 08/936,321

ON BRIEF

Before HAIRSTON, FLEMING, and GROSS, Administrative Patent Judges.

FLEMING, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 1 through 5. Claims 6 through 13 are withdrawn from consideration.

The invention relates to a grid array interconnect structure. The apparatus includes a grid array interconnect structure (10) employing conductive epoxy interconnects (15) and nonconductive transfer tape (14) having an adhesive disposed on both sides. See Appellant's Figure 1 and specification page 4, lines 10-14. The double sided nonconductive transfer tape (14) has the conductive epoxy interconnects (15) formed therethrough. See Appellant's specification page 4, lines 25-30.

The only independent claim 1 present in the application is reproduced as follows:

1. A grid array interconnect structure for use in interconnecting a high density multichip interconnect decal or land grid array package having a plurality of interconnect pads to a printed wiring board having a plurality of input/output pads, said interconnect structure comprising:

double-sided nonconductive transfer tape having adhesive disposed on both sides thereof, and having conductive epoxy interconnects formed therethrough that are configured to connect to the interconnect pads of the high density multichip interconnect decal, or the land grid array package, the input/output pads of the printed wiring board.

References

The references relied on by the Examiner are as follows:

Shreeve et al. (Shreeve)	5,046,953	Sep. 10, 1991
Cranston et al. (Cranston)	4,902,857	Feb. 20, 1990

Rejections at Issue

Claims 1-5 stand rejected under 35 U.S.C. § 103 as being unpatentable over Shreeve and Cranston.

Rather than repeat the arguments of Appellant or the Examiner, we make reference to the Briefs¹ and the Answer for the respective details thereof.

OPINION

After a careful review of the evidence before us, we do not agree with the Examiner that claims 1 through 5 are unpatentable under 35 U.S.C. § 103 over Shreeve and Cranston.

¹ Appellant filed an Appeal Brief on May 24, 1999. Appellant then filed a Reply Brief on September 14, 1999. The Examiner mailed an Office communication on November 24, 1999 stating that the Reply Brief has been entered.

Appellant argues that, “the Cranston et al. patent does not disclose or suggest that the electrically conductive particles comprise epoxy.” See page 2 lines 18-19 of the Reply Brief. The Appellant further argues that neither the Shreeve nor the Cranston references “disclose or suggest ‘a grid array interconnect structure comprising double sided nonconductive transfer tape having adhesive disposed on both sides thereof, and having conductive epoxy interconnects formed therethrough’”. See page 2 lines 23-27 of the Reply Brief.

In rejecting claims under 35 U.S.C. § 103, the Examiner bears the initial burden of establishing a *prima facie* case of obviousness. *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). The Examiner can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references. *In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598. Only if this initial burden is met does the burden of coming forward with evidence or argument shift to the Appellants. *Oetiker*, 977 F.2d at 1445, 24 USPQ2d at 1444. See also *In re Piasecki*, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (“After a *prima facie* case of obviousness has been established, the burden of going forward shifts to the applicant.’) If the Examiner fails to establish a *prima facie* case, the rejection is improper and accordingly merits reversal. *Fine*, 837 F.2d at 1074, 5 USPQ2d at 1598.

On actual page 3 lines 8-18 of the answer, the Examiner sets forth the rejection of Appellant’s claim 1 as being unpatentable under 35 U.S.C. § 103 over Shreeve and Cranston. The Examiner then states how Shreeve teaches all of the limitations as claimed in claim 1 except for “conductive epoxy as conductive element and also the ... adhesive disposed on both sides.” See actual page 4 lines 11-13 of

the Answer. We note that Appellant has not argued that Shreeve does not teach these limitations. The Examiner then shows how Cranston teaches the missing elements, in particular, the “(DCA) structure characterized by polymer matrix (line 56) made from thermoplastic material, typically an epoxy, which is adhesive (line 57, hence non conductive transfer tape with adhesive on both the sides) and contains chain of conductive spheres, (hence conductive epoxy, line 59).” See actual page 4 lines 15-18 of the answer. Finally, the Examiner states that “the motivation to combine is reliability of connection between an IC and a circuit board.” See actual page 5 lines 11-13 of the answer.

On page 2 of the Reply Brief, Appellant argues that the rejection is erroneous and the teachings relied on by the Examiner “are not supported by the disclosure contained in the Cranston et al. patent.” See page 2 lines 1-2 of the Reply Brief. In particular, Appellant argues that “there is no disclosure or suggestion in the Cranston et al. patent that the conductive spheres are epoxy.” See page 2 lines 3-4 of the Reply Brief. Appellant further argues that the Cranston patent actually discloses “that the use of electrically conductive particles mixed with an insulative polymer matrix may be as an alternative interconnection technique to soldering. The particles are typically, silver-plated nickel or glass sphere, and are dispersed or arranged in the polymer matrix ... each extending through the matrix in the z direction.” See page 2 lines 11-16 of the Reply Brief.

We note that Appellant’s claim 1 recites the following:

... double-sided nonconductive transfer tape having adhesive disposed on both sides thereof, and having conductive epoxy interconnects formed therethrough ...

Therefore, all the claims, because of their dependency on claim 1, require the “conductive epoxy interconnects.”

Upon careful review of Cranston, we find that Cranston does not teach the “double-sided nonconductive transfer tape having adhesive disposed on both sides thereof, and having conductive epoxy interconnects formed therethrough ” as recited in Appellant’s claim 1. Rather, we find that Cranston discloses “a polymer matrix 18 comprised of an [sic, a] sheet or slab of adhesive epoxy ...” See Cranston column 3 lines 12-14. Further we find Cranston discloses that “[p]rior to partial curing of the matrix 18, a plurality of conductive particles 20, typically nickel or glass spheres 22 ... which are coated with a solder 24, are dispersed throughout the matrix.” See Cranston column 3 lines 21-25. Furthermore we find that Cranston discloses that “when the matrix 18, with the particles 20 arranged therein, is sandwiched between the conductive members 12 and 14, and the matrix is then finally cured, the solder coating 24 on the spheres 22 will melt. Typically, the solder 24 is an alloy comprised of tin, lead and bismuth, and either cadmium, thallium and/or indium.” See Cranston column 3 lines 37-44. Finally we find that Cranston discloses that “[t]he advantage of coating the spheres 22 with the low temperature melting solder 24 is that when the matrix 18 is finally cured, the solder melts and creates *a metallurgical bond between the members 12 and 14.*” (Emphasis added) See Cranston column 3 lines 58-61.

Since we find no teaching of Cranston employing a “double-sided nonconductive transfer tape having adhesive disposed on both sides thereof, and having conductive epoxy interconnects formed therethrough”, we find that the rejection of claim 1 as being unpatentable under 35 U.S.C. § 103 over Shreeve and Cranston cannot be sustained.

Further, we find that claims 2 through 5 are dependent from claim 1 and thereby recite the above limitation. Therefore, we find that Shreeve and Cranston fail to teach all of the limitations of

claims 1 through 5, and thereby these claims are not obvious in view of Shreeve and Cranston.

In view of the foregoing, the decision of the examiner rejecting claims 1 through 5 under 35 U.S.C. § 103 is reversed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

REVERSED

KENNETH W. HAIRSTON)	
Administrative Patent Judge)	
)	
)	BOARD OF PATENT
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MICHAEL R. FLEMING)	APPEALS AND
Administrative Patent Judge)	
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