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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte LYNDA G. FLEDERBACH, RICK A. WEED, BRADLEY H. CARTER, ERICH W. GERBSCH, JOHN K. ISENBERG and CARL W. BERLIN

Appeal 2010-010084
Application 11/823,690
Technology Center 2800

Before CARL W. WHITEHEAD, JR., ERIC S. FRAHM and ANDREW J. DILLON, *Administrative Patent Judges*.

WHITEHEAD, JR., *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants are appealing claims 1-13. Appeal Brief 2. We have jurisdiction under 35 U.S.C. § 6(b) (2012).

We affirm.

Introduction

The invention is directed to electrically isolated, thermally conductive prepackaged components having an ultra-thick thick film (UTTF) on ceramic substrates. *Generally* Specification 1-5.

Illustrative Claim

1. A pre-packaged component device comprising:

> a first non-conductive substrate member having an outer surface;
>
> a second non-conductive substrate member having an outer surface;
>
> a first layer of ultra-thick thick film material secured to the outer surface of said first non-conductive substrate member;
>
> a second layer of ultra-thick thick film material secured to the outer surface of said second non-conductive substrate member; and
>
> lead members and a transistor member positioned between surfaces of said first and said second non-conductive substrate members opposite said outer surfaces.

Rejections on Appeal

Claims 1-7 and 9-13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Gerbsch (U.S. Patent Application Publication Number

2003/0132511 A1; published July 17, 2003 (Gerbsch '511)) and Myers (U.S. Patent Number 5,395,679; issued March 7, 1995). Answer 3-9.

Claim 8 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Gerbsch '511, Myers and Lautzenhiser (U.S. Patent Number 5,527,627; issued June 18, 1996). Answer 9-10.

Claims 1-7 and 9-13 stand rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-5, 8 and 9 of Gerbsch (U.S. Patent Number 6,812,553 B2; issued November 2, 2004 (Gerbsch '553)) and Myers. Answer 10-11.

Claim 8 stands rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 3 of Gerbsch '553, Myers and Lautzenhiser. Answer 11.

Claims 1-5, 7 and 9-13 stand rejected on the ground of nonstatutory obviousness- type double patenting as being unpatentable over claims 1 and 5 of Gerbsch (U.S. Patent Number 7,095,098 B2; issued August 22, 2006 (Gerbsch '098)) and Myers. Answer 11

Claim 6 stands rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of Gerbsch '098, Myers and Gerbsch '553. Answer 11-12.

Claim 8 stands rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of Gerbsch '098, Myers and Lautzenhiser. Answer 12.

Issue on Appeal

Do Gerbsch '511 and Myers, either alone or in combination, disclose a pre-packaged component device having UTTF layers positioned on the outside of the substrates?

ANALYSIS[1]

We have reviewed the Examiner's rejections in light of Appellants' arguments that the Examiner has erred. We disagree with Appellants' conclusions. We concur with the findings and reasons set forth by the Examiner in the action from which this appeal is taken and the reasons set forth by the Examiner in the Answer in response to Appellants' Appeal Brief. However, we highlight and address specific findings and arguments for emphasis as follows.

Appellants' arguments are directed to claim 1. Appeal Brief 2. Appellants agree with the Examiner's findings that Gerbsch fails to "specifically teach that solderable, electrically conductive layers are UTTF layers." Appeal Brief 4. "In other words, it is admitted in the rejection that the Gerbsch et al. '511 reference does not disclose a pre-packaged

[1] Throughout the Analysis section of the Decision, Gerbsch (U.S. Patent Application Publication Number 2003/0132511 A1; published July 17, 2003) will be referred to simply as Gerbsch since Appellants' arguments are directed at the 35 U.S.C. § 103 (a) rejection of claim 1 based upon Gerbsch and Myers. Appeal Brief 4.

component device having ultra-thick thick film (UTTF) material secured to the outer surfaces of the substrate members." Appeal Brief 4. Appellants argue that the Myers reference cited by the Examiner fails to address the noted deficiency of Gerbsch. *Id.*

Appellants argue that:

> [T]he specific embodiments of Myers et al. '679 that are relied upon in the rejection do not have UTTF layers disposed on outer surfaces of non-conductive substrates sandwiching lead members and a transistor member. Therefore, Myers et al. '679 does not teach the limitations that Gerbsch et al. '511 admittedly fail to disclose. Thus, the rejection relies upon an incorrect generalization (i.e., Myers et al. '679 teaches that which Gerbsch et al. '511 admittedly fail to teach, namely, the requirement for a UTTF layer disposed on each of opposite outer surfaces of non-conductive substrates sandwiching a transistor member and lead members). The inappropriateness of this generalization is verified by the specific embodiments mentioned in the rejection.
>
> In the rejection, there is not any attempt to explain why it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the UTTF layers of Myers et al. '679 as outer heat dissipative layers in the device of Gerbsch et al. '511, rather than using the direct bonded copper (DBC) solderable layers, which are the only solderable electrically conductive materials that are expressly disclosed by Gerbsch et al. '511.

Appeal Brief 5.

We do not find Appellants' arguments to be persuasive. The Examiner finds that:

> Gerbsch et al. does not specifically teach that the solderable copper layers (23, 25) are ultra-thick thick film

layers. However, Myers et al. does teach these limitations. Myers et al. teaches a high power device (38 shown in fig. 3 and col. 4, lines 29-55) which dissipates heat that through an adjacent layer of Sn/Pb (40) to a first UTTF layer of silver-palladium (42), then to a layer of alumina (44), a second ultra-thick thick film layer (UTTF 46) of silver-palladium disposed opposite the high power device (38) with respect to the alumina substrate (44), a second Sn/Pb layer (48), and a copper buffer layer (50). From fig. 2 and col. 3, line 4 - col. 4, line 28, Myers also teaches that a UTTF layer (30) formed on an alumina substrate may be of copper instead of silver-palladium, and consist of two component layers: a "high-adhesion" layer adjacent to the alumina substrate consisting of 81.3% copper powder, and a "high-solderability" layer with 91.8% copper powder.

In summation, Myers teaches a high power device connected to an alumina substrate with a UTTF layer disposed on the other side which is solderable and made predominantly of copper. The disclosure of Myers et al. (see col. 2, line 63 - col. 3, line 3) states that the inventive UTTF film distinguishes itself over the prior art by allowing for lateral heat dissipation in addition to vertical dissipation. The solderable copper layer of Gerbsch et al. represents only an improved vertical dissipation characteristic, so it would have been obvious to one of ordinary skill in the art at the time of invention was made to replace the solderable copper layers on the outer surfaces of the non- conductive substrates of Gerbsch by solderable copper ultra-thick thick film layers as taught by Myers et al. that would represent an improvement, since doing so would provide for lateral heat dissipation in addition to vertical dissipation. Furthermore, these two heat dissipative layers, UTTF layer and DBC layer, were art-recognized equivalents at the time the invention was made, a person of ordinary skill in the art would have found it obvious to substitute one for the other.

Answer 4-5.

We agree with the Examiner's findings. Appellants argue that there was "not any attempt to explain why it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the UTTF layers of Myers et al. '679 as outer heat dissipative layers in the device of Gerbsch et al. '511." Appeal Brief 5. We again do not find Appellants' arguments to be persuasive. The test for obviousness is what the combined teachings of the references would have suggested to one of ordinary skill in the art. *See In re Kahn*, 441 F.3d 977, 987-88 (Fed. Cir. 2006), *In re Young*, 927 F.2d 588, 591 (Fed. Cir. 1991) and *In re Keller*, 642 F.2d 413, 425 (CCPA 1981). The Examiner can satisfy this test by showing some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.

Appellants' claimed invention non-conductive substrates (22, 24, Figures 1-3) are formed out of ceramic materials (Specification 3); therefore while the substrates are electrically non-conductive, they are thermally conductive and therefore not considered to be non-conductive as claimed. Myers discloses employing UTTF layers in conjunction with a ceramic substrate (alumina) to dissipate thermal energy or heat. Myers, Figure 3, column 1, lines 64-68, column 2, and lines 1-8. Modifying Gerbsch by incorporating Myers' UTTF layers to dissipate thermal energy or heat demonstrates reasoning and rational support for the Examiner's legal conclusion of obviousness. *See Kahn*, 441 F.3d at 987-988. Therefore we sustain the Examiner's obviousness rejection of claim 1, as well as, claims 2-7 and 8-13 not separately argued. Appeal Brief 8-9. We also sustain the

Examiner's obviousness-type double patenting rejections of claims 1-13 not separately argued for the reasons stated above. Appeal Brief 9-10.

DECISIONS

The obviousness rejections of claims 1-13 are affirmed.

The obviousness-type double patenting rejections of claims 1-13 are affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv). *See* 37 C.F.R. § 41.50(f).

AFFIRMED

Vsh