

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 24

UNITED STATES PATENT AND TRADEMARK OFFICE

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

Ex parte TAKAYUKI HAZE and TSUNEO YABUUCHI

Appeal No. 2002-1061
Application No. 09/358,365

ON BRIEF

Before COHEN, McQUADE, and NASE, Administrative Patent Judges.
NASE, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1 to 4, 7 to 10, 13 and 14. Claims 11 and 12 have been withdrawn from consideration. Claims 5 and 6 have been canceled.

We REVERSE.

BACKGROUND

The appellants' invention relates to a method for producing double-sided wiring board. A copy of the claims under appeal is set forth in the appendix to the appellants' brief.

The prior art of record relied upon by the examiner in rejecting the appealed claims is:

Adlam et al. (Adlam)	5,861,076	Jan. 19, 1999
Kajita et al. (Kajita)	5,953,634	Sep. 14, 1999

The examiner also relied upon the appellants' admission of prior art (specification, page 1, line 8 to page 3, line 9; Figures 7(a) to 11) relating to a method of making a conventional doubled-sided wiring board (Admitted Prior Art).

Claims 1 and 7 to 9 stand rejected under 35 U.S.C. § 103 as being unpatentable over the Admitted Prior Art in view of Adlam.

Claims 2 to 4, 10, 13 and 14 stand rejected under 35 U.S.C. § 103 as being unpatentable over the Admitted Prior Art in view of Adlam as applied to claim 1 above, and further in view of Kajita.¹

¹ The examiner included claims 11 and 12 in the statement of this rejection (see page 4 of the answer). However, claims 11 and 12 have been withdrawn from consideration "as not directed to the elected claims 1-4, 7-10 and 13-14" (see page 2 of the answer). In addition, page 2 of the brief states that "[c]laims 1-4, 7-10, 13 and 14 are on appeal." Accordingly, we consider claims 11 and 12 to be withdrawn (continued...)

Rather than reiterate the conflicting viewpoints advanced by the examiner and the appellants regarding the above-noted rejections, we make reference to the answer (Paper No. 21, mailed January 29, 2002) for the examiner's complete reasoning in support of the rejections, and to the brief (Paper No. 20, filed January 9, 2002) and reply brief (Paper No. 22, filed March 20, 2002) for the appellants' arguments thereagainst.

OPINION

In reaching our decision in this appeal, we have given careful consideration to the appellants' specification and claims, to the applied prior art, and to the respective positions articulated by the appellants and the examiner. Upon evaluation of all the evidence before us, it is our conclusion that the evidence adduced by the examiner is insufficient to establish a prima facie case of obviousness with respect to the claims under appeal. Accordingly, we will not sustain the examiner's rejection of claims 1 to 4, 7 to 10, 13 and 14 under 35 U.S.C. § 103. Our reasoning for this determination follows.

In rejecting claims under 35 U.S.C. § 103, the examiner bears the initial burden of presenting a prima facie case of obviousness. See In re Rijckaert, 9 F.3d 1531,

¹(...continued)
from consideration, not subject to this rejection, and not on appeal.

1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993). A prima facie case of obviousness is established by presenting evidence that would have led one of ordinary skill in the art to combine the relevant teachings of the references to arrive at the claimed invention.

See In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988) and In re Lintner, 458 F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972).

Claim 1, the only independent claim on appeal, reads as follows:

A method for producing a double-sided wiring board comprising the steps of:

- providing a conductive substrate having first and second opposing conductive surfaces;
- forming a first insulating layer on said first conductive surface of said substrate;
- forming at least one via hole in said first insulating layer on said first conductive surface;
- thermally curing said first insulating layer on said first conductive surface, resulting in said second conductive surface having a first oxidized layer thereon;
- removing said oxidized layer formed on said second conductive surface of said conductive substrate;
- forming a second insulating layer on said second conductive surface from which said first oxidized layer is removed;
- forming at least one via hole in said second insulating layer; and
- forming thin conductive wiring on the surfaces of both said first and second insulating layers, including within both of said via holes, said forming of said thin conductive wiring on both said first and second insulating layers involving using only a single plating process.

The Admitted Prior Art discloses a method for producing a double-sided wiring board comprising the steps of: (1) providing a conductive substrate having first and

second opposing conductive surfaces; (2) forming a first insulating layer on the first conductive surface of the substrate; (3) forming at least one via hole in the first insulating layer on the first conductive surface; (4) thermally curing the first insulating layer on the first conductive surface; (5) forming a second insulating layer on the second conductive surface; (6) forming at least one via hole in the second insulating layer; (7) applying a first copper plating process to outer surfaces of the first and second insulating layers to form first and second copper layers; (8) applying a second copper plating process to outer surfaces of the first and second copper layers to form third and fourth copper layers; and (9) forming thin conductive wiring (i.e., circuits) from the first, second third and fourth copper layers, including within both of the via holes.

Adlam's invention relates to a bond enhancement process for promoting strong, stable adhesive bonds between surfaces of copper foil and adjacent resin impregnated substrates or superimposed metallic sublayers. According to the process of Adlam's invention, the initial step is to treat a surface of the copper foil with an oxidizing agent to form a black copper oxide (CuO). Then, the black oxide-coated copper surface is treated with an aqueous reducing solution containing sodium metabisulfite and sodium sulfide to convert the black oxide coating to a roughened metallic copper coating. The roughened metallic copper-coated surface is then passivated and laminated to a resin impregnated substrate. Adlam teaches that the bond enhancement process is

especially useful in multilayer printed circuit fabrication and in the treatment of copper circuit lines and areas which are disconnected from each other, that is, which do not have electrically conductive continuity. Adlam further teaches that inner-layer laminates prepared according to this process are not susceptible to "pink-ring" formation, exhibit excellent resistance to chemical attack at drilled holes and sheared edges and are stable under thermal and mechanical stresses.

After the scope and content of the prior art are determined, the differences between the prior art and the claims at issue are to be ascertained. Graham v. John Deere Co., 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966).

Based on our analysis and review of the Admitted Prior Art and claim 1, it is our opinion that the differences are: (1) the thermally curing of the first insulating layer on the first conductive surface **resulting in the second conductive surface having a first oxidized layer thereon**; (2) **removing the oxidized layer formed on the second conductive surface of the conductive substrate**; and (3) forming thin conductive wiring on the surfaces of both the first and second insulating layers, including within

both of the via holes, the forming of the thin conductive wiring on both the first and second insulating layers involving **using only a single plating process**.²

In the rejection of claim 1 before us in this appeal, the examiner determined (answer, p. 4) that

[i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to modify [the Admitted Prior Art] by removing the oxidized layer formed on the second conductive surface of the conductive substrate, as taught by Adlam, for the purpose of promoting strong adhesion between adjacent copper foils and polymeric substrates which imparts superior mechanical, thermal and electrical properties and avoids the delimitation [sic, delamination] and loss of adhesion attendant to the so-called pink-ring or "halo" effect.

The appellants argue that the applied prior art does not suggest the claimed subject matter. We agree. In that regard, while it may have been obvious at the time the invention was made to a person of ordinary skill in the art to have applied the teachings of Adlam to the Admitted Prior Art's conductive substrate having first and second opposing conductive surfaces prior to forming any insulating layer thereon by treating the first and second opposing conductive surfaces with an oxidizing agent to form a black copper oxide and then treating the black oxide-coated copper surfaces

² The examiner's determination (answer, p. 3) that the Admitted Prior Art discloses "forming thin conductive wiring on both insulating layers using only a single plating process" finds no support in the disclosure of the Admitted Prior Art and therefore is not sound.

with an aqueous reducing solution containing sodium metabisulfite and sodium sulfide to convert the black oxide coatings to be roughened metallic copper coatings, this modification of the Admitted Prior Art does not result in the claimed method. In our view, the combined teachings of the Admitted Prior Art and Adlam do not teach or suggest (1) thermally curing of the first insulating layer on the first conductive surface **resulting in the second conductive surface having a first oxidized layer thereon;** (2) **removing the oxidized layer formed on the second conductive surface of the conductive substrate;** and (3) forming thin conductive wiring on the surfaces of both the first and second insulating layers, including within both of the via holes, the forming of the thin conductive wiring on both the first and second insulating layers involving **using only a single plating process.**

Since the claimed subject matter of claim 1 is not suggested by the applied prior art for the reasons set forth above, the decision of the examiner to reject claim 1, and claims 2 to 4, 7 to 10, 13 and 14 dependent thereon, under 35 U.S.C. § 103 is reversed.³

³ We have also reviewed the patent to Kajita additionally applied in the rejection of claims 2 to 4, 10, 13 and 14 but find nothing therein which makes up for the deficiencies of the Admitted Prior Art and Adlam discussed above.

CONCLUSION

To summarize, the decision of the examiner to reject claims 1 to 4, 7 to 10, 13 and 14 under 35 U.S.C. § 103 is reversed.

REVERSED

IRWIN CHARLES COHEN
Administrative Patent Judge

JOHN P. McQUADE
Administrative Patent Judge

JEFFREY V. NASE
Administrative Patent Judge

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