

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 EISUKE WAKI, TSUYOSHI TAKATA,
and HIROSHI HAJI

Appeal No. 2000-0302
Application No. 08/796,363

HEARD: January 10, 2001

Before CALVERT, COHEN, and GONZALES, Administrative Patent Judges.

CALVERT, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of 5. Claims 1 to 4 and 6 to 10, the other claims remaining in the application, stand withdrawn from consideration under 37 CFR

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1.142(b) as being directed to nonelected inventions.

Claim 5 reads:

A bump forming method comprising the steps of:

forming a ball at a bottom end of a wire inserted into a central hole of a capillary tool and extended downward by making a torch approach the bottom end of the wire and generating sparks between the bottom end of said wire and said torch;

separating said ball from said wire by lowering said capillary tool relative to said wire; and

further lowering said capillary tool and pressing said ball against an electrode of a workpiece to bond the ball to the electrode.

The reference applied in the final rejection is:

Tiffany	3,357,090	Dec. 12,
1967		

Claim 5 stands finally rejected under 35 U.S.C. § 102(b) as anticipated by Tiffany.

Tiffany discloses a bump (ball) forming method in which wire 58 passing through a capillary tool (quill) 24 is severed by a burner 60 from a lower portion of the wire having a previously-formed ball 50. The burner simultaneously forms a new ball 50 on the lower end of the upper portion of the wire (col. 2, lines 65 to 70). The tool 24 is then lowered

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relative to the wire until it contacts the new ball 50, and then further lowered with the ball until the ball contacts electrode 56, as shown in Figs. 3 to 5 (col. 2, line 70, to col. 3, line 5). Thereafter, the tool is returned to its upper position (Fig. 2), the wire is cut by the burner, and the cycle is repeated (col. 3, lines 15 to 20).

"To anticipate a claim, a prior art reference must disclose every limitation of the claimed invention, either explicitly or inherently." In re Schreiber, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997). Appellants argue that Tiffany does not disclose the claimed step of "separating said ball from said wire by lowering said capillary tool relative to said wire" (emphasis added). The examiner asserts that this step is disclosed at col. 3, lines 16 to 18 of Tiffany (answer, page 5).

The paragraph from which the portion of Tiffany cited by the examiner is taken reads (col. 3, lines 15 to 20):

When the welding is completed (the ball **50** is firmly bonded to the wafer) the quill **24** may be returned to the position shown in Fig. 2, and the cycle may be repeated by severing the wire by the flame cutter **60** to both cut the wire and form a new ball to be deposited on the next

device.

As indicated by the parenthetical insertion in his quotation from this paragraph on page 5, lines 7 to 9 of the answer,¹ the examiner seems to believe that the language "the quill 24 may be returned" means the quill is lowered relative to the wire. This interpretation of Tiffany's disclosure is clearly incorrect because Tiffany specifically states at col. 3, lines 10 to 12, that as the welding is completed the quill 24 is in its lowermost position, so that return of the quill to its Fig. 2 position, as disclosed in col. 3, lines 15 to 17, would necessarily involve raising the quill relative to the wire. Moreover, Tiffany expressly discloses at col. 2, lines 65 and 66, and at col. 3, line 18, that the wire is cut by the burner 60 (thereby separating the welded ball 50 from the wire). We find absolutely no disclosure in the reference of the claimed step of separating the ball from the wire by lowering the capillary tool (quill) relative to the wire.

In view of the foregoing, it should be evident that Tiffany also does not disclose the last-recited step of

¹We note that the quotation does not accurately repeat the text of the Tiffany patent.

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"further lowering said capillary tool and pressing said ball against an electrode

. . ." Contrary to the examiner's statement on page 4 of the answer, claim 5 does require that the ball be pressed against the electrode only after it has been separated from the wire, because this step of the claim recites "further lowering said capillary tool and pressing said ball against an electrode" (emphasis added). The term "further" indicates that the step is performed subsequent to the previously-recited step, and therefore the antecedent of "said ball" is the ball recited in the previously-recited step, namely, the ball which was separated from the wire. By contrast, in the Tiffany method, the ball 50, when pressed against the electrode (as shown in Fig. 4), has not yet been separated from the wire 48.

Accordingly, since Tiffany does not expressly or inherently disclose every limitation of claim 5, the rejection will not be sustained.

Conclusion

The examiner's decision to reject claim 5 is reversed.

REVERSED

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