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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte DENIS LAHAIE and BEVERLEY H. CHRISTIAN

Appeal 2011-005187
Application 11/400,233
Technology Center 1700

Before BRADLEY R. GARRIS, TERRY J. OWENS, and
KAREN M. HASTINGS, *Administrative Patent Judges*.

OWENS, *Administrative Patent Judge.*

DECISION ON APPEAL

STATEMENT OF THE CASE

The Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's rejection of claims 1-10, 12-16 and 23-27, which are all of the pending claims. We have jurisdiction under 35 U.S.C. § 6(b).

The Invention

The Appellants claim an apparatus for use in determining solderability of an electrical component. Claim 1 is illustrative:

1. Apparatus for use in determining solderability of an electrical component, comprising:

a vacuum chamber;

a load sensor comprising a downwardly projecting wetting force measuring pin and a contact portion, the contact portion being disposed within the vacuum chamber at a tip of the downwardly projecting wetting force measuring pin;

a platform disposed within the vacuum chamber in relation to the contact portion and having an upward facing component mounting surface and a mounting member, the electrical component secured to the upward facing component mounting surface by the mounting member; and

a control module providing relative movement between the platform and the load sensor to bring a contact surface of the electrical component into close proximity with the contact portion of the load sensor, wherein the control module is configured to cause solder to be applied to the contact portion of the load sensor, wherein the control module is further configured to bring the solder into contact with the contact surface of the electrical component, and wherein the load sensor measures force arising from wetting of the solder to the contact surface of the electrical component.

The References

Manley	US 3,627,493	Dec. 14, 1971
Zagalskiy	US 5,944,250	Aug. 31, 1999
Solomon	US 6,286,368 B1	Sep. 11, 2001
Nordgren	US 2002/0027434 A1	Mar. 7, 2002
Flake	US 6,360,935 B1	Mar. 26, 2002
Struckmeier	US 2003/0110844 A1	Jun. 19, 2003
Tomizuka (JP ‘064) (as translated)	JP 7-72064 A	Mar. 17, 1995

The Rejections

The claims stand rejected under 35 U.S.C. § 103 as follows: claims 1-4, 7, 14, 23, 24, 26 and 27 over JP '064 in view of Solomon, claims 5 and 6 over JP '064 in view of Solomon and Zagalskiy, claims 8-10 over JP '064 in view of Solomon and Flake, claims 12 and 13 over JP '064 in view of Solomon and Manley, claims 15 and 16 over JP '064 in view of Solomon and Struckmeier and claim 25 over JP '064 in view of Solomon and Nordgren.

OPINION

We reverse the rejections. We need to address only the independent claims, i.e., claims 1 and 23.[1]

JP '064 discloses an apparatus for testing solderability of an electrical component, comprising an electronic balance (11) (which corresponds to the Appellants' load cell) comprising a part maintenance means (12) having a part holding fixture (12a) which supports a downwardly projecting pin (solderability examination bit of metal (19)), a carrier (14) (which corresponds to the Appellants' platform (claim 1) or support (claim 23)) capable of having secured thereto a test printed circuit board (13) (which corresponds to the Appellants' electrical component)[2] having thereon a copper pattern (13b) coated with solder paste (13a) , and a first drive (15) for

[1] The Examiner does not rely upon the additional references applied to claims 5, 6, 8-10, 12, 13, 15, 16 and 25 for any disclosure that remedies the deficiency in JP '064 and Solomon as to the independent claims (Ans. 8-12).
[2] The Appellants acknowledge that "the printed circuit board 13 in Sony Corp. [JP '064] may be considered to be 'secured' to an upward facing carrier 14" (Br. 10) and that "the skilled person would reasonably understand the printed circuit board 13 to be equivalent to Applicant's claimed electrical component" (Reply Br. 4).

bringing the solderability examination bit of metal (19) into contact with the solder paste-coated copper pattern (13b) and then separating them by a micro gap (title; abstract; ¶¶ 0033-43; Figs. 1, 2). The apparatus measures the adhesion between the solder (13a) and the solderability examination bit of metal (19) (¶¶ 0059-67).

The Examiner argues that the parts worked on by the Appellants' apparatus, i.e., the electrical component and the solder, are not part of the apparatus and that although "the intended operation of Sony Corp. [JP '064] is different than the disclosed operation of the instant apparatus (Sony Corp. initially has solder applied to component 13 and the disclosed invention has solder initially applied to the wetting force measuring pin) such does not impart a structural difference which is the basis for patentability in an apparatus claim" (Ans. 5). The Examiner argues that JP '064's apparatus meets the Appellants' claim requirements that "the control module is configured to cause solder to be applied to the contact portion of the load sensor" and "the control module is further configured to bring the solder into contact with the contact surface of the electrical component" by being capable of sequentially moving the solderability examination bit of metal (19) into contact with the solder paste (13a), raising the solderability examination bit of metal (19), and lowering the solderability examination bit of metal (19) into contact with the copper pattern (13b) on the test printed circuit board (13). *See id*.

In response the Appellants argue that if JP '064's solderability examination bit of metal (19) and not the printed circuit board (13) is tested for solderability and, therefore, corresponds to the Appellants' electrical

component, then JP '064's part holding fixture (12a) which holds the solderability examination bit of metal (19) does not correspond to either the Appellants' downwardly projecting wetting force measuring pin or the Appellants' mounting member for securing the electrical component to the upwardly facing component mounting surface (Reply Br. 5).

That argument is unpersuasive as being nonresponsive to the Examiner's arguments that JP '064's solderability examination bit of metal (19) corresponds to the Appellants' downwardly projecting wetting force measuring pin, JP '064's test printed circuit board (13) having a copper pattern (13b) thereon corresponds to the Appellants' electrical component, and JP '064's apparatus is capable of indicating the force arising from wetting of the solder (13a) to the contact surface of the copper pattern (13b) on the test printed circuit board (13) (Ans. 4-5).

Hence, we are not persuaded of reversible error in the rejections as to the Appellants' independent claims' load sensor, platform (claim 1), support (claim 23) or control module.

The Appellants' independent claims also require that the apparatus comprises a vacuum chamber. To meet that claim requirement the Examiner relies upon Solomon (Ans. 6).

Solomon discloses that brazing temperatures are substantially greater than typical common soldering temperatures and that commercially available wetting balances configured for testing solder wetting lack the capability for suitably testing brazes (col. 7, ll. 29-33). Solomon's wetting balance (10) for testing brazes includes a vacuum chamber (isolation

chamber 30) for reducing undesirable oxidation during the testing process (col. 7, ll. 34-40, 46-53).

The Examiner finds that "most soldering operations are performed under a vacuum or inert gas atmosphere to prevent oxidation and testing under the same conditions as will be realized during actual production is necessary in determining the true solderability of the materials" (Ans. 14-15) and argues that "[i]t would have been obvious to one of ordinary skill in the art at the time of the invention to dispose the components of the testing apparatus (such as the contact portion and platform) in a vacuum chamber in order to prevent undesirable oxidation during the testing (as taught by Solomon et al.) which could alter the test results" (Ans. 6).

The Appellants argue that "Solomon can be interpreted as suggesting that most commercially available wetting balances for testing solder connections would be unsuitable for testing brazes **precisely because they lack a vacuum chamber**, such as isolation chamber 30. The Examiner's contention that most soldering operations are performed under a vacuum or inert gas atmosphere therefore goes against this teaching of Solomon" (Reply Br. 6). The Appellants state that "Applicants deny the Examiner's assertion that 'most soldering operations are performed under a vacuum or inert gas atmosphere.' Applicants do not believe that the skilled person would understand this assertion to be true." *Id*. Thus, the Appellants argue, the Examiner has not established that "it would have been obvious to incorporate the isolation chamber disclosed by Solomon into the test apparatus of Sony Corp. to arrive at the subject matter of claim 1." *Id*.

The Examiner has not provided evidentiary support in response to the Appellants' challenge to the Examiner's finding that most soldering operations are performed under vacuum or in an inert gas atmosphere and conclusion based thereon that it would have been obvious to one of ordinary skill in the art to include Solomon's vacuum chamber (30) in JP '064's apparatus. The Examiner, therefore, has not carried the burden of establishing a prima facie case of obviousness of the Appellants' claimed apparatus. *See In re Piasecki*, 745 F.2d 1468, 1472 (Fed. Cir. 1984); *In re Rinehart*, 531 F.2d 1048, 1051 (CCPA 1976). Accordingly, we reverse the Examiner's rejections.

DECISION/ORDER

The rejections under 35 U.S.C. § 103 of claims 1-4, 7, 14, 23, 24, 26 and 27 over JP '064 in view of Solomon, claims 5 and 6 over JP '064 in view of Solomon and Zagalskiy, claims 8-10 over JP '064 in view of Solomon and Flake, claims 12 and 13 over JP '064 in view of Solomon and Manley, claims 15 and 16 over JP '064 in view of Solomon and Struckmeier and claim 25 over JP '064 in view of Solomon and Nordgren are reversed.

It is ordered that the Examiner's decision is reversed.

REVERSED

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