

UNITED STATES PATENT AND TRADEMARK OFFICE

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

Ex parte JAMES J. HOFMANN and GLENN W. PIPER

Appeal No. 2003-0527
Application No. 09/036,291

ON BRIEF

Before HAIRSTON, PAK, and BARRY, *Administrative Patent Judges*.
BARRY, *Administrative Patent Judge*.

DECISION ON APPEAL

A patent examiner rejected claims 8-20. The appellants appeal therefrom under 35 U.S.C. § 134(a). We reverse.

BACKGROUND¹

The invention at issue on appeal concerns "anodic bonding" of glass to an oxidizable material such as silicon. (Spec. at 1.) During anodic bonding, the materials are heated, and an electric field is applied to draw oxygen ions from the heated glass

¹We agree with the examiner that the Summary of the Invention section of the appellants' brief merely reiterates "pages 9-31 of the[ir] specification. . . ." (Examiner's Answer at 2.)

into the silicon. Those oxygen ions react with the silicon to form silica, a stable oxide that bonds the glass and the silicon. (*Id.* at 1-2.)

The silica formed depends on the charge supplied to create the electric field. According to the appellants, although a minimum amount of silica is needed to ensure a good bond, too much silica can present difficulties. If the silicon is embodied by a thin layer formed on top of a substrate, they explain, forming too much silica may delaminate (i.e., remove) the layer from the substrate. (*Id.* at 2.)

Accordingly, the appellant's invention controls how much oxide is used in anodic bonding. More specifically, their controller includes a switch and a circuit. The switch controls a flow of charge through the materials to be bonded. The circuit monitors a rate of the flow, uses the rate to determine an amount of charge supplied for bonding, and based on the amount or rate, operates the switch to control the flow. (*Id.* at 3-4.) A further understanding of the invention can be achieved by reading the following claim.

8. A system for bonding two materials together, comprising:

a voltage source;

electrodes in contact with the materials; and

a controller configured to:

connect the voltage source to the electrodes to transfer charge to the materials,

measure the charge flowing to the materials, and

disconnect the voltage source from the electrodes in response to the measurement indicating that a predetermined amount of the charge has been transferred to the materials.

Claims 8 and 10 stand rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,368,673 ("Okuda") or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Okuda. Claim 9 stands rejected under § 103(a) as obvious over Okuda and either U.S. Patent No. 5,820,648 ("Akaike") or U.S. Patent No. 5,717,287 ("Amrine"). Claim 11 stands rejected under § 103(a) as obvious over Okuda and U.S. Patent No. 4,631,728 ("Simons"). Claim 12 stands rejected under § 103(a) as obvious over Okuda and U.S. Patent No. 5,357,421 ("Tautz"). Claims 13 and 14 stand rejected under § 103(a) as obvious over Okuda, Tautz, and Simons. Claims 15, 16, 19, and 20 stand rejected under § 103(a) as obvious over Okuda, Tautz, and either Akaike or Amrine. Claims 17 and 18 stand rejected under § 103(a) as obvious over Okuda, Tautz, either Akaike or Amrine, and Simons.

OPINION

Rather than reiterate the positions of the examiner or the appellants *in toto*, we focus on the point of contention therebetween. The examiner asserts, "since rate is measured and a power profile over time established, an amount of charge would be predetermined because Okuda et al also establishes hold times for the application of

voltage across the electrodes (Col. 26, line 48 and Fig. 2B). " (Examiner's Answer at 8.)

The appellants argue, "the Examiner has not shown any terminology that Okuda allegedly uses to describe measuring an amount of charge or disconnecting in response to an indication of a predetermined amount of charge. Instead, Okuda teaches controlling a power profile and monitoring a current (i.e., a rate of charge flow, not an amount of charge) and fails to teach the limitations of the claimed invention."

(Reply Br. at 2.)

In addressing the point of contention, the Board conducts a two-step analysis. First, we construe the independent claims at issue to determine their scope. Second, we determine whether the construed claims are anticipated or would have been obvious.

1. CLAIM CONSTRUCTION

"Analysis begins with a key legal question -- *what is the invention claimed?*" *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1567, 1 USPQ2d 1593, 1597 (Fed. Cir. 1987). In answering the question, "[c]laims are not interpreted in a vacuum, but are part of and are read in light of the specification." *Slimfold Mfg. Co. v. Kinkead Indus., Inc.*, 810 F.2d 1113, 1116, 1 USPQ2d 1563, 1566 (Fed. Cir. 1987) (citing *Hybritech Inc. v. Monoclonal Anti-bodies, Inc.*, 802 F.2d 1367, 1385, 231 USPQ 81, 94-95 (Fed. Cir. 1986); *In re Mattison*, 509 F.2d 563, 565, 184 USPQ 484, 486 (CCPA 1975)).

Here, claim 8 recites in pertinent part the following limitations: "a controller configured to . . . measure the charge flowing to the materials, and disconnect the voltage source from the electrodes in response to the measurement indicating that a predetermined amount of the charge has been transferred to the materials." Claim 12 recites in pertinent part the following limitations: "halt the flow of charge in a response to a predetermined amount of the charge flowing through the associated flowpath." Claim 16 recites similar limitations. The appellants' specification describes the measurement of a predetermined amount of charge as follows.

For purposes of monitoring the amount of charge that is supplied to the materials 24 and 28, the control circuit 31 makes use of the observation that the magnitude of the current I_{BOND} represents a rate at which charge is flowing. In this manner, the total amount of charge that has been supplied for bonding is determined by an integrator circuit 42 that integrates this rate. To accomplish this, the integrator circuit 42 receives an input voltage signal (called V_{CURRENT}) which has a magnitude that represents the magnitude of the I_{BOND} current.

The integrator circuit 42 integrates the V_{CURRENT} signal to generate an output voltage signal (called V_{INT}). The magnitude of the V_{INT} signal represents the ongoing total amount of charge that has been furnished for bonding. A comparator circuit 46 of the control circuit 31 is constructed to receive the V_{INT} signal and assert, or drive high, a digital output signal (called V_{COMP}) when a predetermined amount of charge has been furnished for bonding, i.e., when the magnitude of the V_{COMP} signal exceeds a predetermined threshold level. When the V_{COMP} signal is asserted, a latch circuit 48 drives a digital output signal (called V_{OUT}) high to indicate when the predetermined total amount of charge has been delivered.

(Spec. at 12.) Reading the limitations in light of the specification, the independent claims require integrating an input voltage signal having a magnitude that represents

the magnitude of a bonding current, generating an output voltage signal having a magnitude that represents the ongoing total amount of charge that has been furnished for bonding, and halting the flow of the bonding current when the ongoing total amount of charge exceeds a predetermined threshold.

2. ANTICIPATION AND OBVIOUSNESS DETERMINATIONS

"Having construed the claim limitations at issue, we now compare the claims to the prior art to determine if the prior art anticipates those claims." *In re Cruciferous Sprout Litig.*, 301 F.3d 1343, 1349, 64 USPQ2d 1202, 1206 (Fed. Cir. 2002). "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros., Inc. v. Union Oil Co.*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987) (citing *Structural Rubber Prods. Co. v. Park Rubber Co.*, 749 F.2d 707, 715, 223 USPQ 1264, 1270 (Fed. Cir. 1984); *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548, 220 USPQ 193, 198 (Fed. Cir. 1983); *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 771, 218 USPQ 781, 789 (Fed. Cir. 1983)). "[A]bsence from the reference of any claimed element negates anticipation." *Kloster Speedsteel AB v. Crucible, Inc.*, 793 F.2d 1565, 1571, 230 USPQ 81, 84 (Fed. Cir. 1986).

Here, Okuda "join[s] two ceramic bodies in a large size or in a complicated shape by heating electrically a butted portion to be jointed. . . ." Col. 1, ll. 15-17. More specifically, "[t]wo ceramic bodies in a pipe form are connected with butted portion to be

jointed and are jointed to each other by arranging electrodes at the periphery around the butted portion to be jointed." Col. 25, ll. 55-58. "The electrodes 4a to 4h are connected to an electric power source 52 through switching terminals 51a to 51h of an electrode switching member 51. A control member 54 receives a signal from a detection member 53 for detecting the output voltage, electric current and electric power of the electric power source 52." Col. 26, ll. 19-25. "The switching member 51 and the electric power source 52 are controlled by the output signal from the control member 54 in accordance with the signal of th[is] dedection [sic]." *Id.* at ll. 28-31.

We are unpersuaded that the reference's detection member 53 or control member 54 integrates an input voltage signal having a magnitude that represents the magnitude of a bonding current, generates an output voltage signal having a magnitude that represents the ongoing total amount of charge that has been furnished for bonding, or halts the flow of the bonding current when the ongoing total amount of charge exceeds a predetermined threshold. To the contrary, Okuda's "joining process is . . . controlled by an electric power control pattern as shown in FIG. 2 (A)," *id.* at ll. 42-44, wherein "[t]he[] electric power control pattern . . . [is] input in advance in the control member 54 of the current supplying control apparatus 5 to be automatically controlled." Col. 27, ll. 1-4. As shown in Figure 2(A), the electric power control pattern is defined in

terms of power rather than a voltage having a magnitude that represents the ongoing total amount of charge that has been furnished for bonding,

The absence of integrating an input voltage signal having a magnitude that represents the magnitude of a bonding current, generating an output voltage signal having a magnitude that represents the ongoing total amount of charge that has been furnished for bonding, and halting the flow of the bonding current when the ongoing total amount of charge exceeds a predetermined threshold negates anticipation.

Therefore, we reverse the anticipation rejection of claim 8 and of claim 10, which depends therefrom.

"In rejecting claims under 35 U.S.C. Section 103, the examiner bears the initial burden of presenting a *prima facie* case of obviousness." *In re Rijckaert*, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993) (citing *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992)). "A *prima facie* case of obviousness is established when the teachings from the prior art itself would . . . have suggested the claimed subject matter to a person of ordinary skill in the art." *In re Bell*, 991 F.2d 781, 783, 26 USPQ2d 1529, 1531 (Fed. Cir. 1993) (quoting *In re Rinehart*, 531 F.2d 1048, 1051, 189 USPQ 143, 147 (CCPA 1976)).

Here, the examiner does not allege, let alone show, that the addition of Tautz, Akaike, Amrine, or Simons cures the aforementioned deficiency of Okuda. Absent a teaching or suggestion of integrating an input voltage signal having a magnitude that represents the magnitude of a bonding current, generating an output voltage signal having a magnitude that represents the ongoing total amount of charge that has been furnished for bonding, and halting the flow of the bonding current when the ongoing total amount of charge exceeds a predetermined threshold, we are unpersuaded of a *prima facie* case of obviousness. Therefore, we reverse the obviousness rejections of claim 8; of claims 9-11, which depend therefrom; of claim 12; of claims 13-15, which depend therefrom; of claim 16; and of claims 17-20, which depend therefrom.

CONCLUSION

In summary, the rejection of claims 8 and 10 under § 102(b) is reversed. The rejections of claims 8-20 under § 103(a) are also reversed.

REVERSED

KENNETH W. HAIRSTON)
Administrative Patent Judge)
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CHUNG K. PAK
Administrative Patent Judge

LANCE LEONARD BARRY
Administrative Patent Judge

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TIMOTHY N. TROP
TROP, PRUNER, HU & MILES, P.C.
8554 KATY FREEWAY, STE. 100
HOUSTON , TX 77024