

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte SUKANTA BANERJEE and HUI HUANG

Appeal 2008-1902
Application 10/868,451
Technology Center 1700

Decided: June 30, 2008

Before CHUNG K. PAK, ROMULO H. DELMENDO, and
JEFFREY T. SMITH, *Administrative Patent Judges*.

SMITH, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from a final rejection of claims 1-14, 31, and 32. We have jurisdiction under 35 U.S.C. § 6.¹

¹ In rendering this decision we have considered the Appellants' arguments presented in the Appeal Brief submitted July 3, 2007 and the Substitute Reply Brief submitted October 9, 2007.

Appellants' invention relates to a method of affixing an array of microparticles in a series of recesses in a substrate surface. Representative claim 1 appears below:

1. A method of affixing an array of microparticles in a series of recesses in a substrate surface, comprising:
 - placing microparticles in said series of recesses in a manner such that one microparticle resides in any one recess;
 - placing a nanoparticle suspension on the substrate surface over said series of recesses having microparticles therein;
 - incubating the nanoparticle suspension with the microparticle containing substrate

whereby numerous nanoparticles get deposited and wedged between the microparticle and the walls of the recess in which it resides.

The prior art set forth below is relied upon by the Examiner as evidence of obviousness:

Seul	2003/0082587 A1	May 1, 2003
Kelso	2003/0129296 A1	Jul. 10, 2003
Weber	2005/0048570 A1	Mar. 3, 2005

The claims on appeal have been rejected as follows:

Claims 1-2 and 31 stand rejected as unpatentable under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.

Claims 1-14, 31, and 32 stand rejected as unpatentable under 35 U.S.C. § 112, second paragraph, as indefinite.

Claims 1-4, 6-12, 14, and 31 stand rejected as unpatentable under 35 U.S.C. § 103(a) over Seul.

Claim 5 stands rejected as unpatentable under 35 U.S.C. § 103(a) over Seul in view of Kelso.

Claim 13 stands rejected as unpatentable under 35 U.S.C. § 103(a) over Seul in view of Weber.

35 U.S.C. § 112, second paragraph, Rejection

Claims 1-14, 31, and 32 stand rejected as unpatentable under 35 U.S.C. § 112, second paragraph, as indefinite. The Examiner in the Answer has repeated several rejections under §112, second paragraph. The Examiner in the response to the arguments portion of the Answer, page 10, states the following:

A) 112 second paragraph

a) Claim 1 : The applicant has argued that "it" clearly refers to the microparticle. The examiner suggests substituting "microparticle" for "it".

b) Claim 1 : The applicant has argued that there are "numerous" microparticles in the suspension. However, the claim reads "numerous nanoparticles get deposited", which is quite different from how many nanoparticles are in the suspension. In addition, drawings 3A and 3B would suggest that there are a limited number of nanoparticles that get deposited.

c) Claims 6 and 14: the applicant has argued that depression and recess are the same. The examiner suggests using one common term throughout the claims.

d) Claim 31 : the applicant has argued that "the" before "between" should be removed: However, the claim would still read "...gap above between the curved surface.. .", which does not make sense.

e) Claim 32: the applicant has argued that excess means any nanoparticle suspension that is not wedged. The examiner does not agree that this meaning is obvious from claim 32.

We note that regarding paragraphs a and c above the Examiner has acknowledged the terminology of the claims as presented by Appellants is merely editorial in nature. Therefore, these particular rejections do not rise to the level of being insolubly ambiguous as to warrant an indefiniteness rejection. We do not agree with the Examiner's rejection based on a term "numerous" (paragraph b above). A person of ordinary skill in the art would have recognized that in a suspension of particles there are numerous particles. For the Examiner to assert otherwise is not persuasive. We do not agree with the Examiner that the subject matter of claim 32 is indefinite because we find no reasonable basis that establishes that a person skilled in the art would not understand the scope of the limitation in question.

(Paragraph e above). The person of ordinary skill in the art would understand, as asserted by Appellants, "the excess" in claim 32 refers to any nanoparticle suspension that is not wedged. As to the subject matter of claim 31, rejection stated in paragraph d, we agree with the Examiner that the claim language is indefinite. The Appellants acquiesced to the Examiner's reasoning and proposed a modification. However, Appellants' proposed modification does not clarify the claimed subject matter. Therefore, we affirm the Examiner's rejection of claim 31 and reverse the Examiner's rejection of claims 1-14 and 32.

35 U.S.C. § 112, first paragraph, Rejection

Claims 1, 2, and 31 stands rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the original Specification in such a way as to enable one skilled in the art to make and/or use the invention.

The issue presented is: Has the Examiner established that the subject matter of claims 1, 2, and 31 does not meet the written description requirement of 35 U.S.C. § 112, first paragraph? We answer this question in the negative.

The Examiner asserts that the Specification does not disclose “numerous” as used in claim 1, “nanoparticle coating” as used in claim 2, and “microparticle nearer to the substrate surface” as used in claim 31. Further explanation has not been provided.

The Examiner bears the initial burden of presenting a *prima facie* case of unpatentability, whether the rejection is based on prior art or any other ground. *See In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). An *ipsis verbis* disclosure is not necessary to satisfy the written description requirement of § 112. Instead, the disclosure needs only to reasonably convey to persons skilled in the art that the inventor had possession of the subject matter in question. *See In re Edwards*, 568 F.2d 1349, 1351-52 (CCPA 1978).

The Appellants have referenced specific portions of the specification, paragraphs (inter alia, 18 and 32) for describing the disputed subject matter. (See the portion of the Briefs² responding to the § 112, first paragraph rejection). The Examiner has not adequately addressed why the cited portions of the specification do not indicate that a person of ordinary skill in the art would have

² Appellants have not provided page numbering for the submitted Briefs.

recognized that the inventor had possession of the subject matter in question

Accordingly, we reverse the Examiner's 35 U.S.C. § 112, first paragraph, rejection of claims 1, 2, and 31 as lacking an adequate written description for the subject matter presently claimed.

35 U.S.C. § 103 Rejections

Appellants appeal the rejections of claims 1-14, 31, and 32 under 35 U.S.C. § 103(a). Claims 1-4, 6-12, 14, and 31 stand rejected as unpatentable under 35 U.S.C. § 103(a) over Seul. Claim 5 stands rejected as unpatentable under 35 U.S.C. § 103(a) over Seul in view of Kelso. Claim 13 stands rejected as unpatentable under 35 U.S.C. § 103(a) over Seul in view of Weber.

We have thoroughly reviewed each of Appellants' arguments for patentability. However, we are in complete agreement with the Appellants that the claimed subject matter would not have been obvious to one of ordinary skill in the art within the meaning of § 103 in view of the applied prior art. Accordingly, we reverse one of the Examiner's rejections for substantially the reasons set forth by the Appellants in the Briefs, which we adopt and incorporate herein.³

The Examiner bears the initial burden of presenting a prima facie case of obviousness. *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). In order to establish a prima facie case of obviousness, the Examiner must show that each and every limitation of the claim is

³ In rendering this decision we have limited our discussion to claim 1, the sole independent claim on appeal.

described or suggested by the prior art or would have been obvious based on the knowledge of those of ordinary skill in the art. *In re Fine*, 837 F.2d 1071, 1074 (Fed. Cir. 1988)). “[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (*quoted with approval in KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1741 (2007)).

The Examiner contends that Seul teaches affixing of microparticle beads on a substrate surface in a recess by dispensing aliquots of a suspension of microparticle beads onto the substrate evaporating liquid from the suspension. The Examiner further contends that paragraph 0097 of Seul describes depositing nanoparticles after microparticle beads have been placed in recesses on a substrate. (Ans. 6).

Appellants contend that paragraph 0097 of Seul discloses the charged polymer layer (nanoparticles) is deposited on the chip prior to the deposition of the microparticles. In contrast, claim 1 requires: the nanoparticle suspension to be coated on after the microparticles/beads are in place in the wells. (Substitute Reply Brief second page).

The issue before us is whether Appellants have shown that the Examiner erred in rejecting the claims under 35 U.S.C. § 103. The issue turns on whether the paragraph 0097 of Seul describes depositing nanoparticles after microparticle beads that are deposited and wedged between the microparticle and the walls of the recess of a substrate.

The Examiner relies upon paragraph 0097 of Seul reproduced below:

[0097] In certain embodiments of the invention, a gel covering the bead array area can be used to prevent the beads from dislodging. In other embodiments, chemical functional groups on the bottoms and/or the sidewalls of the recesses can be used to link the beads to the surface. A charged polymer can also be used to coat the chips prior to bead deposition. The charge of the polymer coating is chosen to be opposite to that of the beads, so that the beads will be electrostatically attracted to the polymer. When a bead is in a charged polymer-coated recess, the Coulombic attraction between the bead and the sidewalls and bottom of the recess serves to hold the bead in the recess. In this way, the bead retention rate during processing and assaying is increased. In some embodiments, a second charged polymer is deposited on the chip surface after beads have been placed in the recesses. The charge of the second polymer is chosen to be the same as that of the bead, so that no polymer is deposited on the bead, but the surface charge on the chip is neutralized. Several variants of this techniques can be implemented with minimal alteration of the core process. For example, a single polyelectrolyte layer may be used, or a multi-layered structure (having alternating positive and negative polymer layers) can be constructed to yield a coating with a more uniform and controlled thickness. Further, instead of polymers, charged polymer nanoparticles alone or in combination with charged polymers can also be used. An uncharged but low T_g (glass transition temperature) polymer and/or nanoparticle coating can also be used to improve the adhesion of the beads to the chip surface.

Seul discloses a process for securing microparticles in recesses in a substrate. Seul achieves this objective by placing a polymer coating having a charged opposite to that of the microparticle beads on the substrate containing the recesses prior to application of the microparticle beads. Seul

discloses that the charged coating is utilized for attracting and holding the microparticle bead in the recess. Seul also discloses the application of a second polymer coating over the microparticle bead. However, this coating is selected to have a charge that is the same as the microparticle bead so that no polymer is deposited on the bead. It is recognized that Seul discloses instead of polymers, charged polymer nanoparticles alone or in combination with charged polymers can also be used. The Examiner did not provide any acceptable evidence or reasoning to demonstrate that if charged nanoparticles are utilized as the second coating that these particles would get deposited and wedged between the microparticle and the walls of the recess as required by the claimed invention.

The Examiner has not established obviousness in this case. For the foregoing reasons, the rejections of claims 1-14, 31, and 32 under 35 U.S.C. § 103(a) are reversed.

ORDER

The rejections of claim 31 under 35 U.S.C. § 112, second paragraph, is affirmed.

The rejection of claims 1-14 and 32 under 35 U.S.C. § 112, second paragraph, is reversed.

The rejection of claims 1, 2, and 31 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement is reversed.

The rejections of claims 1-14, 31, and 32 under 35 U.S.C. § 103(a) are reversed.

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).

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AFFIRMED IN PART

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ERIC P. MIRABEL
35 TECHNOLOGY DRIVE
SUITE 100
WARREN, NJ 07059