

This opinion is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MURATA MANUFACTURING CO., LTD.

Appeal 2007-4313
Application 10/286,172
Technology Center 1700

Decided: September 27, 2007

Before FRED E. McKELVEY, *Senior Administrative Patent Judge*, and
RICHARD E. SCHAFER and RICHARD TORCZON, *Administrative
Patent Judges*.

TORCZON, *Administrative Patent Judge*.

DECISION ON APPEAL

The subject matter of the claims on appeal relates to an apparatus and a method for electroplating small plating pieces. All claims under consideration stand rejected. The appellant (Murata) seeks review of some of the rejections. We affirm.

THE CLAIMS

Claims 1-3, 7-11, 14-16, 20, and 21 remain under consideration, other claims having been cancelled or withdrawn from consideration. Murata has not presented separate arguments for the claims for the two contested

rejections. Consequently, we select claim 1 as representative of the claims on appeal. The remaining claims stand or fall with claim 1. (37 C.F.R. § 41.37(c)(vii).) Claim 1, which we reproduce from the claim appendix of the Appeal Brief (Br.) defines the invention as follows:

An apparatus for plating a plurality of small-sized plating-pieces comprising:

a plating bath in which a plating solution is provided;

a cathode and an anode made of conductors, which are dipped into the plating solution, respectively, the cathode having a substantially flat upper surface which is to contact with the small-sized plating-pieces and at least one recess formed on the upper surface; and

a container which contains a plurality of the small-sized plating-pieces in the plating solution, and the cathode is arranged so as to define a portion of the bottom of the container;

wherein a plurality of the small-sized plating-pieces are caused to contact with the cathode in the plating solution, and conduction is carried out between the cathode and the anode, so that plating films are deposited onto the small-sized plating-pieces.

We are obliged to give a claim the broadest construction that is reasonable in view of the specification. We understand "wherein" clause at the end of the claim to reinforce the purpose of the apparatus stated in the preamble, but not to otherwise further limit the structures of the apparatus.

THE REJECTIONS

Indefiniteness

Claim 10 stands rejected under 35 U.S.C. 112(2) for indefiniteness. Murata presented no arguments for this rejection. Consequently, the rejection of claim 10 is AFFIRMED.

Obviousness

The examiner entered three obviousness rejections—

All claims under consideration stand rejected for encompassing subject matter that would have been obvious to a person having ordinary skill in the art at the time the application was filed in view of admitted prior art and:

John H. Oesterle & Kenneth D. Hughes, *Electrochemical reclamation of heavy metals from natural materials such as soil*, US 5,656,140 (1997).

Dan Jacobus, Matrix for forming mesh, US 3,833,482 (1974).

Frederick A. Lowenheim, Electroplating 12-13 (1978).

This rejection is AFFIRMED for the reasons given below.

A subset of the claims (1-3, 8, 10, 11, 14-16, 20, and 21) stand rejected in view of Oesterle, Jacobus, Lowenheim, and additionally a Lashmore patent. Since we affirm a similar rejection of all claims, we do not reach this second rejection of a subset of the claims.

Finally, claims 7 and 9 stand rejected in view of Lashmore, Oesterle, Jacobus, Lowenheim, and an additional Lashmore patent. Murata has not presented arguments for this rejection, however. Consequently, the rejection of claims 7 and 9 is AFFIRMED.

ANALYSIS

In analyzing obviousness, the scope and content of the prior art must be determined, the differences between the prior art and the claims ascertained, and the ordinary level of skill in the art resolved. Objective evidence of the circumstances surrounding the origin of the claimed subject

matter (so-called secondary considerations) may also be relevant. One function of secondary considerations is to guard against the employment of impermissible hindsight. *Graham v. John Deere Co.*, 383 U.S. 1, 17, 36 (1966), *cited with approval in KSR Int'l v. Teleflex Inc.*, 127 S. Ct. 1727, 82 USPQ2d 1385 (2007). The record on appeal does not contain objective evidence of secondary considerations.

*Scope and content of the prior art and
differences from the claimed subject matter*

Admitted prior art

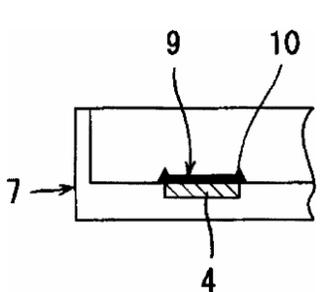
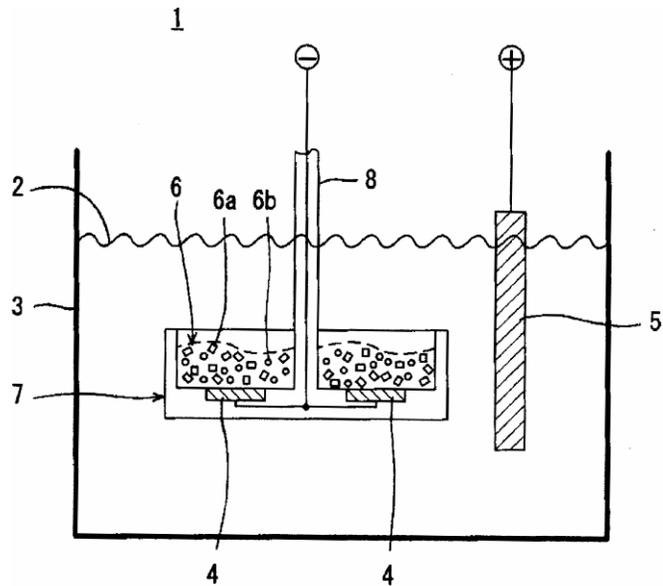
While neither the Final Rejection nor the Examiner's Answer identify the admitted prior art with precision, the examiner identified the following material as admitted prior art in the first "final" rejection at 2, entered 24 August 2005:

The admitted prior art is that shown in figure 6, of the application, labeled "Prior Art," and the accompanying description in the specification under the heading "Description of the Related Art". Figure 6 shows a plating bath 3 in which plating solution 2 is provided. Cathode 4 and anode 5 are dipped in the plating solution. The cathode has a flat upper surface and defines a portion of the component container 7. Workpieces 6 to be plated contact the cathode during plating.

The admitted prior art is purportedly a Japanese laid-open application (JP 5-70999) that is not in the record. Murata has not contested the availability of this material as prior art, but does dispute its significance.

We base our understanding of this prior art solely on the admissions in Murata's specification. (Specification (Spec.) 1-4 and FIGS. 6 & 7.)

Murata's FIG. 6 (right) shows a basic plating apparatus 1 with a plating solution 2 in a plating bath 3 and with cathodes 4 and an anode 5. A container 7 in the bath 2 holds plating pieces 6. A vertical shaft 8 permits agitation of the container 7 and pieces 6 to ensure more even plating.



Murata explains that cathodes 4 tend to accumulate deposits 9. See FIG. 7 (left). The smooth cathodes 4 of the prior art develop protuberances 10 in the deposit 9 at the edges of the cathodes 4. The protuberances 10 interfere with the agitation of the pieces 6 and prevent adequate contact with the cathodes 4. The admitted prior art lacks the claimed improvement of providing at least one recess in the otherwise flat upper surface of the cathodes.

The Oesterle patent

Oesterle discloses using an electrochemical process to remove heavy metal from natural soil. (Oesterle 1:1-9.) Oesterle maximizes the surface area of the cathode, while minimizing its footprint inside the limited space with the reaction tank, by introducing grooves into the face of the cathode.

(Oesterle 4:24-35.) Oesterle notes that it is well known in the art that cathodes work by attracting positively charged ions. (Oesterle 5:5-29.)

Oesterle is in a very different field of invention (soil remediation) and Oesterle's apparatus is not designed for small-piece electroplating. Like Murata, however, Oesterle is addressing a problem in electrochemical deposition systems. We find that one in the small-piece electroplating art would have considered a teaching regarding maximizing the space-efficiency of a cathode in a limited reaction area to be pertinent to the problems facing the small-piece electroplating art.

Murata notes that Oesterle's grooves are vertical and thus different from Murata's claimed upper-surface recesses.

The Lowenheim reference work

Lowenheim is a basic electrochemical reference work and the portion of record does not relate to any specific application. Instead it is cited for its explanation of Faraday's law in the context of electroplating. Faraday's law is relevant in this context because it shows that current is a result-effecting variable in electroplating. Essentially, increased current relates to increased rate of electrochemical change.

The Jacobus patent

We do not need to reach the Jacobus patent in our analysis because the broad principles for which it is cited are more clearly developed in the Oesterle patent.

The ordinary level of skill

We look to the evidence of record—the applicant's disclosure, the cited references, and any declaration testimony—in resolving the ordinary level of skill in the art. We focus on what those of skill in the art know and can do.

The specification and cited references reveal a highly developed and sophisticated art. The admitted prior art shows that those in the small-piece electroplating art were familiar with the basic apparatus and method of electroplating. Small pieces are held in a hopper and agitated so they have many opportunities for coming into contact with the cathode at the bottom of the hopper.

Oesterle pointedly limits its tutorial on considerations in the electroplating art because the control considerations are already so well understood. (Oesterle 5:5-29.) Those in the art would appreciate from Oesterle, however, that the size of the cathode within the tank can be space-efficiently maximized by making the surface irregular. (We suspect those in the art already appreciated that increased surface area usually relates to increased reaction rate in a chemical system.)

Lowenheim shows that the basic theory behind electroplating dates back nearly two centuries. Lowenheim provides numerous examples and explains misunderstandings underlying apparent exceptions to the theory.

We have no testimony per se in the record. We recognize that Murata argues those skilled in the art would not appreciate the relevance of Oesterle and Lowenheim to the specific problems of small-piece plating. (Br. 12-13.) Attorney argument is no substitute for evidence, however, and is entitled to no evidentiary weight. The examiner has not presented Oesterle and

Lowenheim as authorities in small-piece electroplating, but rather as evidence of what is generally known in the electrochemical arts.

Those skilled in the general electrochemical arts would have appreciated that a larger cathode surface exposed to the solution would increase the rate of electrochemical changes. Those in the electroplating art would have appreciated that greater cathode surface area would relate to the plating rate.

Murata argues that the problem it is solving is different than the one addressed by increasing current. A larger cathode surface solves more than one problem. It does not matter which problem leads to the adoption of the grooved cathode since doing so solves both problems. A nice side benefit of adopting a grooved cathode would be that it would incidentally increase the cathode area available for contact with, and the agitation of, the small pieces in the solution.

Finally, while Murata correctly notes that the grooves in Oesterle's vertical cathode are vertically oriented in the side faces of the cathode. From this Murata argues that moving the grooves to the upper surface of Oesterle's cathode would make no sense. We agree, but the argument misapprehends the rejection and underestimates the skill in the art. The rejection proceeds from the premise that the reason for putting grooves into the cathode involves increasing cathode surface in contact with the solution. The cathode in the admitted prior art that is being improved contacts the solution on its upper surface. Thus, to apply the teachings of the prior art to the admitted prior art, those in the art would modify the upper surface of the admitted prior art cathode to increase its contact with the solution.

CONCLUSION

Art from an unrelated field may nevertheless be pertinent to the problem facing the inventor. Where, as here, the art is applied for a broad teaching in the general field to which the claimed subject matter belongs, the fact that it is part of an unrelated end use is of little concern. Similarly, subject matter may be obvious for reasons other than those that inspired the inventor. If the art teaches or suggests a combination for another reason, the combination would still have been obvious.

The examiner has provided reasons for applying the teachings of the art regarding grooved cathodes to the admitted prior art such that the apparatus of claim 1 would have been obvious to a person having ordinary skill in the art. The other claims under consideration were not separately argued and so they fall with claim 1.

HOLDING

The rejection of claims 1-3, 7-11, 14-16, 20, and 21 is—

AFFIRMED

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STEPHEN R. FUNK
MURATA MANUFACTURING COMPANY, LTD.
% KEATING & BENNETT, LLP
8180 GREENSBORO DRIVE, SUITE 850
MCLEAN, VA 22102