

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 25

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte GLENN J. LEEDY

Appeal No. 1998-2422
Application 08/488,380¹

ON BRIEF

Before THOMAS, BARRETT, and LEVY, Administrative Patent Judges.

BARRETT, Administrative Patent Judge.

¹ Application for patent filed June 7, 1995, entitled (as amended in Paper No. 7) "Electro-Magnetic Lithographic Alignment Method," which is a continuation of Application 08/315,905, filed September 30, 1994, now U.S. Patent 5,869,354, issued February 9, 1999, which is a division of Application 07/865,412, filed April 8, 1992, now U.S. Patent 5,354,695, issued October 11, 1994.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the final rejection of claims 77-88.

We reverse.

BACKGROUND

The disclosed invention relates to a method and apparatus for aligning a membrane lithographic fabrication tool as described in the specification at page 76, line 29, to page 83, line 3, with respect to figures 28a, 28b, 29l, 29m, 29n, 29p, 30, and new figures 33-35.

Claim 77 is reproduced below.

77. A method of aligning a membrane lithographic fabrication tool comprising a low-stress deposited dielectric layer to a semiconductor substrate to be exposed by the tool, comprising the steps of:

providing a first conductive coil pattern on a surface of the semiconductor substrate;

applying electrical current to the first coil pattern;

providing a second conductive coil on a surface of the tool capable of sensing an electro-magnetic field;

sensing an electro-magnetic field generated by the first coil in the second coil; and

aligning the tool according to the signal sensed by the second coil.

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The Examiner relies on the following references:

Keogh et al. (Keogh)	5,008,619	April 16, 1991
Leedy	5,580,687	December 3, 1996

Claims 77-80 and 83-88² stand rejected under the judicially created doctrine of obviousness-type double patenting over claims 3-5, 10, and 11 of Leedy.

Claims 77-88³ stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Keogh and common knowledge in the art.

We refer to the Final Rejection (Paper No. 19) (pages referred to as "FR__") and the Examiner's Answer (Paper No. 22) (pages referred to as "EA__") for a statement of the Examiner's position, and to the Brief (Paper No. 21) (pages referred to as "Br__") and the Reply Brief (Paper No. 23) (pages referred to as "RBr__") for a statement of Appellant's arguments thereagainst. The Examiner noted entry and

² The Examiner's Answer, page 3, rejects claims 77-88. However, the Final Rejection (Paper No. 19) only rejects claims 77-80 and 83-88. Thus, claims 81 and 82 are not considered to be rejected.

³ The Examiner's Answer, page 3, rejects claims 77-80. This is considered to be an inadvertent error because the Final Rejection (Paper No. 19) rejects claims 77-88 and the Examiner does not indicate that the rejection of claims 81-88 is withdrawn.

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consideration of the Reply Brief, but did not present any further reasons (Paper No. 24).

OPINION

Double Patenting

Appellant argues that the double patenting rejection over Leedy, U.S. Patent 5,580,687 ('687 patent), is improper by reason of estoppel because of the restriction requirement in the ultimate parent Application 07/865,412 ('412 application) to both the '687 patent and this application (Br3; RBr1). Copies of the original claims and the restriction requirement in the '412 application are submitted with the Response (Paper No. 18) filed August 13, 1997. Appellant argues (Br3):

Note that Claims 45 and 46, corresponding to the claims of the present application, are grouped with Group IX, and that Claims 69-74, corresponding to the claims of the '687 patent are grouped with Group XI. The Patent Office has therefore previously made a determination, relied upon by applicant, that the present invention and the invention of the '687 patent are indeed patentably distinct.

The Examiner does not answer this argument. The Examiner concludes that claims 77-80 are obvious over claims 3-5 of the '687 patent because they are broader than and encompass the subject matter of claims 3-5, and that claims 83-88 are obvious over claims 3-5, 10, and 11 of the '687 patent because

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they are broader than and encompass the subject matter of claims 3-5, 10, and 11 (FR2-3; EA3).

It is manifest that claims 77-80 and 83-88 are obvious over claims 3-5, 10, and 11 of the '687 patent because claims 3-5, 10, and 11 of the '687 patent contain all the limitations of claims 77-80 and 83-88 plus additional limitations. However, this does not answer Appellant's argument about the estoppel effect of the restriction requirement.

Section 121, third paragraph, (section 121[3]) of 35 U.S.C. provides that where the Patent and Trademark Office (PTO) requires restriction, the patent of either the parent or any divisional application thereof conforming to the requirement cannot be used as a reference against the other. Section 121[3] effects a form of estoppel that shields the applicant from having to prove the correctness of the restriction requirement in order to preserve the patentability of a divisional application. See Studiengesellschaft Kohle mbH v. Northern Petrochemical Co., 784 F.2d 351, 357-61, 228 USPQ 837, 842-45 (Fed. Cir. 1986) (Newman, J., concurring). Section 121[3] will not apply to remove the

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patent as a reference where the principle of consonance (maintaining a line of demarcation) is violated. See Symbol Technologies Inc. v. Opticon Inc., 935 F.2d 1569, 1579, 19 USPQ2d 1241, 1249 (Fed. Cir. 1991). Because of section 121[3], the PTO bears a heavy burden to guard against erroneous requirements for restriction. See Manual of Patent Examining Procedure § 804.01 (5th ed., Rev. 14, Nov. 1992).

Here, there is no assertion that Appellant has violated the principle of consonance by amending the claims so as to bring them back over the line imposed by the restriction requirement. It is clear that claims 77 and 83 correspond to claims 45 and 46⁴ in the '412 application. Nor has the Examiner argued that the restriction requirement was imposed in error. It is not clear that we would have the authority to review the correctness of the restriction requirement or do anything about it even if it was in error. See Studiengesellschaft, 784 F.2d at 360, 228 USPQ at 844. Because of the restriction requirement in the '412 application, 35 U.S.C. § 121[3] precludes application of the

⁴ It is presumed that claim 46 was intended to depend on claim 45 rather than claim 5.

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'687 patent in an obviousness-type double patenting rejection. Accordingly, the rejection of claims 77-80 and 83-88 is reversed.

Obviousness

Keogh discloses a system for determining the relative position of a first object with respect to a second object using electrical detection of registration (abstract). The registration can be used during the manufacture of multi-layer printed circuit boards (PCBs), but is not limited to that particular application (col. 6, lines 6-11). A first conductive pattern (called a "driver coil," col. 6, line 21) on one layer is driven with an alternating current at a suitable frequency and is moved relative to a second conductive pattern on a second layer (abstract). Voltage induced in the second pattern by the electromagnetic field of the first pattern is detected and indicates the positional relationship between the first and second conductive patterns (abstract). Thus, the claimed method and apparatus for detecting the positional relationship between two layers using conductive coils is expressly taught in Keogh.

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The Examiner's position is as follows (FR5):

Keogh conceptually discloses the same claimed invention except for its use for lithographic fabrication tool. Artisan having ordinary skill in the art would select such system for any tool adjustment on the basis of its suitability for the intended use as a matter of obvious engineering design selection. Consequently, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the device of Keogh to align the fabrication tool since it was known in the art to align any tool by passing current into one coil and detecting the respective magnetic field in other coil as taught by Keogh.

Appellant argues that "Keogh's methods are not compatible with the methods of the present invention nor is it obvious that Keogh's apparatus could be scaled down to the microscope [sic] feature size required for application to lithography" (Br4).

The Examiner does not respond to this argument. Nevertheless, we are not persuaded by the argument because Appellant provides no reasons why Keogh is incompatible with the claimed subject matter and, in fact, there appears to be no difference between the coils and detection system of Keogh and the claimed invention other than the size necessary to provide the appropriate positional accuracy. Appellant has not stated why one of ordinary skill in the art would not have considered it obvious to scale the coils in Keogh down to the

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appropriate size for positioning of a lithography tool. In our opinion, one of ordinary skill in the art would have had sufficient knowledge to recognize the applicability of the system in Keogh to the positioning of objects other than PCB layers.

Appellant argues that "[n]ot taught or suggested in Keogh are the electronic sense amps needed to accurately sense the small currents and fields of the present invention or the necessity that the sense electronics be part of the membrane mask in order to ensure that sensing can be effected" (Br4) and that "Claims 77 and 83 both, either explicitly or implicitly, call for sensing circuitry as part of the lithography tool" (Br5).

The Examiner does not respond to this argument. In particular, the Examiner does not address the limitation of "a control logic unit mounted on the membrane" in claim 83. However, we do not base our decision on this limitation. It is noted that method claim 77 does not expressly or impliedly require the sensing circuitry to be part of the lithography tool.

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Appellant argues that the suitability of Keogh for alignment of PCB layers does not make that system suitable for lithography tool alignment in semiconductor manufacture because the alignment tolerances required for semiconductor manufacture are at least two orders of magnitude smaller than for multi-layer PCB fabrication (Br4).

The Examiner does not respond to this argument. Nevertheless, we are not persuaded by the argument because Appellant provides no reason why one of ordinary skill in the art would not have considered it obvious to scale the coils in Keogh down to the appropriate size for positioning of a lithography tool. Since there is no difference between the coils and detection system of Keogh and the claimed invention other than the size needed for the appropriate positioning accuracy, we do not see how the teachings of Keogh can be considered inappropriate for a lithographic positioning tool.

Appellant argues that because small coils are required for semiconductor manufacture, the lithographic tool must be in intimate contact with the wafer and the coils on the wafer, and that conventional prior art lithographic tools require high vacuum pressure to achieve intimate contact which does

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not allow for movement of the lithographic tool and the wafer relative to one another (Br4). It is argued that the semiconductor membrane technology of the present invention allows intimate contact under very light pressure (Br4-5).

That is (RBr2):

The present inventor pioneered and is alone in the inorganic dielectric membrane art. The use of this membrane art in combination with the claimed electromagnetic sensing method to achieve lithographic alignment is necessarily novel. The apparatus claims are novel in the material that the apparatus is fabricated from (semiconductor membrane), it is novel in the intent of the application (lithography), it is novel in the use of sensing electronics integrated as part of the membrane, and it is novel in the way it achieves mechanical proximity to the surface of the substrate (low stress flexible membrane).

It is argued, with respect to the method claims, that a membrane lithographic fabrication tool permits intimate contact to be achieved under very slight pressure (RBr2). The Examiner does not respond to these arguments about the novelty of the membrane lithographic fabrication tool, but only addresses the obviousness of applying the alignment system of Keogh to a conventional lithographic fabrication tool (EA4).

The argument that the combination of a novel material (semiconductor membrane) with the sensing method is novel is persuasive. The preamble of method claim 77 recites a

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"membrane lithographic fabrication tool comprising a low-stress deposited dielectric layer" and since the body of the claims recites "providing a second conductive coil on a surface of the tool," the preamble limitations about the tool are incorporated into the body of the claim. Apparatus claim 83 recites a "membrane comprising a low-stress deposited dielectric layer." These membranes are argued to be novel and the Examiner has not shown otherwise. Thus, even if the alignment apparatus and method are known, the claimed subject matter as a whole has not been shown to be nonobvious. Cf. In re Ochiai, 71 F.3d 1565, 1569-70, 37 USPQ2d 1127, 1131 (Fed. Cir. 1995) (use of a new starting material in an old process is nonobvious). For this reason, the rejection of claims 77-88 is reversed.

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CONCLUSION

The rejection of claims 77-80 and 83-88 under obviousness-type double patenting is reversed.

The rejection of claims 77-88 under 35 U.S.C. § 103(a) is reversed.

REVERSED

JAMES D. THOMAS)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
LEE E. BARRETT)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
)	
)	
STUART S. LEVY)	
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