UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte DAVID J. KELLER

Appeal 2007-2686
Application 10/930,518[1]
Technology Center 1700

Decided: December 28, 2007

Before TEDDY S. GRON, CAROL A. SPIEGEL, and MARK NAGUMO, *Administrative Patent Judges*.

GRON, *Administrative Patent Judge*.

DECISION ON APPEAL

Introduction

This is an appeal under 35 U.S.C. § 134 from an Examiner's final rejection of Claims 1, 3-6, 8-10, 12-15, 19, 20, 22-25, 27-30, 32-34, and 36-38, all claims pending, in Application 10/930,518, filed August 31, 2004.

---

[1] Applicant claims benefit under 35 U.S.C. § 120 of the August 29, 2002, filing date of Application 10/230,570, now U.S. Patent 6,875,559 B2, issued April 5, 2005. The Examiner accepted the terminal disclaimer filed on December 8, 2005, disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of U.S. Patent 6,875,559 B2.

All claims stand finally rejected under 35 U.S.C. § 103(a) for obviousness in view of the combined teachings of Keller, U.S. Patent 6,069,087, issued May 30, 2000, and Williams et al. (Williams), U.S. 6,583,065 B1, issued June 24, 2003, based on application 09/366,509 filed August 3, 1999.

For the reasons stated hereinafter, the appealed final rejection of all claims pending in this application is REVERSED.

Discussion

The Examiner argues that the subject matter encompassed by the claims on appeal is unpatentable in view of the applied prior art because the claims on appeal are not limited to a method for etching wordlines which comprises the two distinct acts of: a) stabilizing a layer of patterned photoresist overlying a plurality of layers and a bottom anti-reflectant coating layer by utilizing an etching process, and b) etching the plurality of layers through the stabilized layer of patterned photoresist (Examiner's Answer (Ans.), p. 6, first para.). Claim 1, which is representative of the subject matter claimed, reads (Amended Appeal Brief filed October 10, 2006 (App. Br.), Appendix Of Claims On Appeal (App'x); Claim 1):

1. A method for etching wordlines comprising the acts of:

> a) stabilizing a layer of patterned photoresist overlying a plurality of layers and a bottom anti-reflectant coating layer by utilizing an etching process, wherein the patterned photoresist comprises a 193 nanometer photoresist and the etching process etches the bottom anti-reflectant coating layer under the patterned photoresist; and
>
> b) etching the plurality of layers through the stabilized layer of patterned photoresist using an etchant more selective to the plurality of layers than to the stabilized layer of patterned photoresist to produce the wordlines.

According to the Examiner (Ans., p. 6, first para.):

> [T]he claimed process is a two-step etching process. The claims recite stabilizing (under a) and etching (under b). The claims do not recite that the two processes occur as distinct steps and the claim language does not distinguish the process from the [one-step] stabilizing and etching process of Keller. The language of the claims allows for a smooth transition between stabilization and etching as taught by Keller. Keller teaches a process which involves two steps – passivation and then a continuation of the process to involve etching.

Claim interpretation is a matter of law. *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 372 (1996). During examination, claims are to be given their broadest reasonable interpretation. *In re Zletz*, 893 F.2d 319, 321 (Fed Cir. 1989); *In re Prater*, 415 F.2d 1393, 1404-05 (CCPA 1969). However, it is fundamental patent law that the claim language may not be construed in a manner inconsistent with the description of the invention in the specification. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1315-16 (Fed. Cir. 2005) (*en banc*).

To interpret the full scope and content of the method Appellant claims, one looks first to the claim language itself. *Phillips v. AWH Corp.*, 415 F.3d at 1312-13. Should the language of the claims appear ambiguous, one looks to the specification for enlightenment, clarification, and definition. *Id.* at 1313-16. The specification is the primary basis for construing the claims. *Id.* at 1315.

The Examiner has read the methods of Claims 1, 15, and 25 as comprising two acts which may be performed in a manner distinct or indistinct of each other (Ans. 6). According to the Examiner, Appellant agrees that each of the methods of Claims 1, 15, and 25 comprises two acts.

However, Appellant argues that the acts are distinct and, read in light of the specification, must be performed in two distinct steps (Ans. 6).

We agree with the Examiner's conclusion that the term "acts" itself ordinarily and customarily refers to two or more acts. Absent limitations on the terms of the claims in the remainder of the claim language or a narrower definition in the specification, the term "acts" should be broadly construed to include two acts performed sequentially or simultaneously. In this case, however, it appears from the claim language as a whole that the act of etching the plurality of layers through the stabilized layer of patterned photoresist may not, and cannot, occur until after the bottom anti-reflective coating layer overlying the plurality of layers is etched away as the layer of patterned photoresist is stabilized against selective etching of the underlying plurality of layers. Therefore, we look to those portions of the specification upon which the Examiner based the broader interpretation of the claim language. We find that the Examiner did not rely on any teaching in the supporting specification for the broader interpretation of the subject matter claimed.

To the contrary, having considered all the specification's teachings, we only find passages which support Appellant's comparatively narrow interpretation of the scope of the claims. For example, the specification teaches (Specification (Spec.), pp. 10-11, bridging para.; emphasis added):

> After patterning the desired structure into the resist layer 22, the underlying material layers may be etched to transfer the pattern from the resist into the underlying layers. However, as previously discussed, conventional etching techniques may result in shredding, tearing, shrinking, striation, and/or the formation of other disadvantageous anomalies in the 193nm resist 22. Accordingly, a technique for stabilizing the resist 22 may be implemented to reduce

> the likelihood of damage to the resist layer 22 during the etch process. After stabilizing the resist 22, a second step may be implemented to complete the etch process.

With reference to Figs. 2-3, the specification teaches (Spec., p. 11, first full para.; emphasis added):

> To etch the BARC layer 20, a first etchant having a particular chemical composition that not only etches the BARC layer 20, but advantageously stabilizes the resist layer 22 may be implemented. Fig. 3 illustrates the structure 10, after the BARC layer 20 has been etched to form windows 26A-26E. . . . Specifically, implementing an etchant including a fluorine source, a polymer source, and an oxygen source to etch the BARC layer 20 may be advantageous. With the addition of a fluorine source, a polymer source, and an oxygen source to the bottom anti-reflectant coating etchant, the BARC layer 20 may be etched to form the same pattern formed in the resist 22, while also stabilizing the structure patterned in the layer of resist 22. The stabilization allows the resist 22 to be more resistant to the remainder of the etching processes.

The specification describes the following embodiment (Spec., pp. 11-12, bridging para.; emphasis added):

> [T]he bottom anti-reflectant coating etchant may be a fluoride source with a polymer source and oxygen source added to it. More specifically, the bottom anti-reflectant coating etchant may be a CF_4 source with CH_2F_2 as a polymer source and O_2 as the oxygen source. In this embodiment, certain ratios of the CF_4, CH_2F_2, and O_2 are able to act as a good bottom anti-reflectant coating etchant that stabilizes the resist 22 to allow the pattern formed in the resist 22 to remain intact throughout the remainder of the etch process.

We find no lack of clarity at all in the following passage (Spec., pp. 12-13, bridging para.; emphasis added):

> Following the bottom anti-reflectant coating etch process, the dielectric layer 18 and the other remaining layers may be etched. Advantageously, because of the stabilization process described above,

> the pattern formed in the resist 22 and BARC layer 20 (Fig. 3) will maintain integrity. The etching process may implement a second etchant having a high selectivity of nitride to resist so that the remaining layers may be etched quickly and evenly with little or no striation in the structure.

Ultimately, the specification explains (Spec., p. 13, first full para.), "To etch the remaining layers, an etchant having a high selectivity of dielectric to resist is advantageously implemented."

We conclude that the Examiner twice committed reversible error in this case. First, the Examiner interpreted specific terms and phrases in Appellant's claims without considering all the claim language. Second, when faced with language ambiguities, the Examiner did not consult the supporting specification in aid of claim interpretation. Had the Examiner followed the sound guidance and direction of *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (*en banc*), she might have recognized her errors in the first instance. On review, we must REVERSE.

Order

On consideration of all the evidence of record, and for the reasons stated herein, it is

ORDERED THAT the Examiner's final rejection of Claims 1, 3-6, 8-10, 12-15, 19, 20, 22-25, 27-30, 32-34, and 36-38, all claims pending, in Application 10/930,518, filed August 31, 2004, under 35 U.S.C. § 103(a) for obviousness in view of the combined teachings of Keller, U.S. Patent 6,069,087 and Williams, U.S. 6,583,065 B1, is REVERSED; and

FURTHER ORDERED THAT the application is returned to the Examiner for action consistent with our decision and opinion in support thereof.

REVERSED

sd

cc (via First Class Mail):

Michael G. Fletcher
FLETCHER YODER
P.O. Box 692289
Houston, TX 77269-2289