Paper No. 13

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte DAVID K. FOOTE and MINH V. NGO

Appeal No. 2000-1955
Application No. 08/857,055

ON BRIEF

Before KIMLIN, KRATZ and LIEBERMAN, Administrative Patent Judges.

KIMLIN, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 1-10 and 16-28. Claims 11-15, the other claims remaining in the present application, stand withdrawn from consideration pursuant to an election requirement. Claim 1 is illustrative:

1. A process for forming an anti-reflective coating on a semiconductor structure, comprising the steps of:

(a) forming an anti-reflective layer of a material selected from the group consisting of silicon oxime, silicon oxynitride, and silicon nitride on the structure; and

(b) growing a barrier layer on the anti-reflective layer using a nitrous oxide plasma discharge to convert a surface portion of the anti-reflective layer into silicon dioxide.

The examiner relies upon the following references as evidence of obviousness:

Nagahisa et al. (Nagahisa) 5,888,855 Mar. 30, 1999

Stanley Wolf Ph.D. and Richard N. Tauber Ph.D. (Wolf), 1 Silicon Processing for the VLSI Era 427-28, 441 (Lattice Press, Sunset Beach, CA 1986)

Admitted Prior Art, page 1

Appealed claims 1-10 and 16-28 stand rejected under 35 U.S.C. § 103 as being unpatentable over Nagahisa in view of Wolf and the Admitted Prior Art. The examiner's rejection under the judicially-created doctrine of obviousness-type double patenting over U.S. Patent No. 5,710,067 has been withdrawn (see page 7 of Answer, first paragraph).

Upon careful consideration of the opposing arguments presented on appeal, we find that the examiner has not established a prima facie case of obviousness for the claimed invention. Accordingly, we will not sustain the examiner's rejection.

Since Nagahisa discloses a process of forming a silicon nitride film on a semiconductor structure and treating the silicon nitride film with a nitrous oxide plasma to oxidize a surface portion of the silicon nitride film, the examiner reasons that the referenced silicon nitride film and oxidized surface

portion thereof correspond to the presently claimed anti-reflective layer and barrier layer, respectively. However, the examiner has not effectively refuted appellants' position that "Nagahisa does not disclose or suggest an anti-reflection layer" (page 8 of Brief, first paragraph) because "[w]hereas an anti-reflection coating for ultraviolet photolithography typically has a thickness of less than approximately 500 angstroms, Nagahisa's channel protective layer 133 has a thickness of approximately 3,000 angstroms (e.g., column 8, lines 53-55), which is far too thick to provide an anti-reflective function" (page 8 of Brief, third paragraph). In response to appellants' argument the examiner states that "it is noted that the features upon which applicant relies . . . are not recited in any of the process claims under rejection" (page 5 of Answer, second paragraph).

Manifestly, the examiner's response misses the point. The appealed claims specifically recite "an anti-reflective layer," and the examiner has not established, in the first instance, that the channel protective film 133 of Nagahisa, having a thickness of 3,000 angstroms, would have qualified as an anti-reflective layer to one of ordinary skill in the art at the time of filing the present application. The examiner has pointed to no teaching in Nagahisa that the channel protective film 133 can serve as an

anti-reflective layer, and has furnished no evidence that one of ordinary skill in the art would have considered the 3,000 angstrom thick protective film of the reference an anti-reflective layer.

In addition, the examiner has not adequately addressed appellants' argument that "[w]hereas the silicon dioxide layer in Nagahisa promotes adhesion of the channel protective layer and the photoresist layer, the present barrier layer performs the opposite function of inhibiting chemical interaction between these two layers" (page 9 of Brief, third paragraph).

In conclusion, based on the foregoing, the examiner's decision rejecting the appealed claims is reversed.

REVERSED

EDWARD C. KIMLIN Administrative Patent Judge	)	
PETER F. KRATZ Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
PAUL LIEBERMAN Administrative Patent Judge	)	

ECK:clm

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