THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 32

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte SIDDHARTHA DAS, HARRY H. FUJIMOTO
and HENRY GAW

Appeal No. 95-3936
Application 08/135,324[1]

ON BRIEF

Before CAROFF, METZ and HANLON, ***Administrative Patent Judges***.

METZ, ***Administrative Patent Judge***.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from the examiner's refusal to allow claims 10 and 12 through 14. The

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[1] Application for patent filed October 13, 1993. The instant application is a continuation of Serial Number 07/887,408, filed on May 19, 1992, and now abandoned; said abandoned application is a continuation of Serial Number 07/682,574, filed on April 8, 1991, and now abandoned.

examiner has indicated in his advisory action (Paper Number 24 - mailed on June 9, 1994) that claims 15 through 17 and 23 through 25 are allowed. Claim 11 has been objected to in the advisory action without explanation of the basis for the objection. Accordingly, only claims 10 and 12 through 14 are before us for consideration and claims 11, 15 through 17 and 23 through 25 form no issue in this appeal.

THE INVENTION

The claimed invention is directed to a process for forming a photoresist pattern. The process comprises the conventional steps of coating a wafer with a photoresist, irradiating the photoresist with radiation of a predetermined wavelength to generate photoacid defining a latent image in said photoresist and baking the latent image formed by the photoacid. Appellants discovered that by protecting the latent image formed on the photoresist on the wafer after generation of photoacid but before baking the latent image a sharper, better defined image is obtained.

Claim 10, the sole independent claim before us, is reproduced below for a more facile understanding of appellants' claimed invention.

10. A process for forming a photoresist pattern

comprising the steps of:

coating a wafer with a photoresist, said photoresist producing a photoacid when irradiated with radiation of a predetermined range of wavelengths, said photoacid catalyzing a chemical reaction when said photoresist is baked to increase the solubility of said photoresist in the irradiated areas with respect to the solubility of said photoresist in the non irradiated areas;

irradiating said photoresist on said wafer with said radiation of a predetermined wavelength to generate said photoacid defining a latent image in said photoresist on said wafer, said irradiating step following said coating step;

preventing said photoacid from being neutralized; and

baking said latent image in photoresist on said wafer, said baking step following said preventing step.

The examiner has not relied on any prior art to reject the appealed claims.

Claims 10 and 12 through 14 stand rejected under 35 U.S.C. § 112, first paragraph, on the grounds that the appealed claims are based on a disclosure which is only "enabling" for nitrogen or water as the agent which prevents the photoacid from being neutralized. We affirm.

OPINION

The question before us is whether appellants' disclosure would have enabled the hypothetical person of

ordinary skill in the art at the time appellants' invention was made to make the claimed invention. In re Glass, 492 F.2d 1228, 1232, 181 USPQ 31, 34 (CCPA 1974). 35 U.S.C. § 112, first paragraph, requires a reasonable correlation between the scope of what is claimed and the scope of enablement provided by appellants' specification to the person of ordinary skill in the art. In re Vaeck, 947 F.2d 488, 495, 20 USPQ2d 1438, 1444 (Fed. Cir. 1991); In re Fisher 427 F.2d 833, 839, 166 USPQ 18, 24 (CCPA 1970).

Although the examiner's statement of the rejection and underlying rationale in support of the rejection are not models of clarity, we understand the rejection to be founded on the examiner's determination that although claim 10 utilizes the language "preventing said photoacid from being neutralized", appellants' disclosure only describes the use of nitrogen and water as being useful for that purpose. The examiner reasons that the two disclosed "species" do not provide an adequate basis for the scope of the claim language of "preventing said photoacid from being neutralized." The examiner opines that in light of the unpredictability in the art, except for the disclosure of nitrogen and water as being useful, it would have required undue experimentation for the

ordinarily skilled person in the art to determine other useful agents for preventing neutralization.

Appellants argue that because the use of "chemical ambients does not involve complex chemical reactions" (page 5 of the main brief), selection of "ambients" or suitable media would have been readily ascertainable to one skilled in the art by actually selecting an "ambient" or medium and determining whether the photoacid becomes neutralized. Appellants suggest by this argument that if the routineer tests a candidate for the "ambient" or medium and it prevents neutralization of photoacids then it is appellants' invention and the disclosure is enabling. We disagree.

We consider appellants' position to be tantamount to an invitation to the routineer to experiment. An invitation to experiment does not constitute enablement, especially where, as here, there is little or no guidance in the specification which would direct the routineer in his or her search for "ambients" or suitable media. Thus, we agree with the examiner that it would have required "undue" experimentation by the skilled routineer to find media other than nitrogen or water which would suit appellants' purpose in claim 10 for "preventing said photoacid from being

neutralized."

Factors to be considered in determining whether a disclosure would require "undue" experimentation include (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of the routineer in the art, (7) the predictability or lack thereof in the art, and (8) the breadth of the claims. In re Wands, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988).

Our review of appellants' specification reveals scant little information concerning criteria for selecting other "ambients". Appellants describe at page 9, lines 19 through 20, the problem which their invention addresses. Therein, appellants state that:

> If the wafer is left in an open air environment, the acid neutralizes, such that it is not an effective catalyst.

At page 3 of the specification, appellants state that:

> The present invention overcomes this problem by avoiding the effects of the clean room ambient during the post exposure period.

Subsequently, appellants disclose at page 5, lines 5 and 6

that:

> After exposure, the wafer is maintained in an inert medium to ensure that the latent image remains stable.

Lines 10 through 15 of page 5 inform us that:

> In one embodiment, the inert medium can be nitrogen gas. In another embodiment, the wafer can be maintained in water. In another embodiment, the wafer can be maintained in nitrogen during the exposure of the wafer. Finally, the nitrogen or other inert atmospheric conditions can also be employed to regenerate the surface of the latent image after it has been subjected to the normal clean room ambient.
>
> At page 10, line 5 through page 11, line 9,

appellants discuss several embodiments of their invention.

Specifically, after a series of conventional, prior art

processing steps but before post exposure baking appellants

disclose that:

> the water cassette used to hold the wafers during lithography process 100 could be modified to provide an inert gas ambient for the wafers after exposure. (page 5, lines 5 through 8)

It is also disclosed that:

> In the currently preferred embodiment the wafer ambient is the inert gas nitrogen. (page 5, lines 10 and 11)

As an alternative, the wafers may be stored in water rather

than an inert gas (page 5, lines 14 and 15). Or, the wafer

handling portion of the apparatus could be enclosed and nitrogen flowed inside the chamber (page 5, lines 16 through 20). Finally, the entire exposure process could be conducted in a nitrogen ambient instead of air, which is conventional (page 5, line 21 through page 6, line 3).

The above referenced portions of appellants' disclosure are the entire disclosure relevant to the issue before us. We reiterate that we find little or no guidance beyond the two, specifically enumerated expedients, which would aid the ordinarily skilled routineer in selecting other suitable media for performing appellants' process. We agree with examiner's implicit conclusion that it would have required undue experimentation by the person of ordinary skill to practice the claimed invention. While appellants argue that "the use of chemical ambients in conjunction with the 'preventing' step does not involve complex chemical reactions", the issue before us concerns the scope of the step of preventing neutralization of the photoacid not the use of "chemical ambients".

We find no guidance in appellants' disclosure nor have appellants directed us to any, which would serve as a starting point for the routineer to even begin a search for

other "ambients". Nothing save the ability of the "ambient" or media to prevent neutralization of the photoacids is described. There are no working examples in the specification. Nevertheless, the nature of the neutralization and the mechanism by which appellants prevent or inhibit neutralization is not described. We recognize that an applicant for patent need not understand or even know how the claimed invention functions. But, in this scenario, we find understanding the mechanism of how nitrogen, a gas present in approximately 80 volume percent in ambient air, or water, a liquid, each function to inhibit neutralization would have presented the ordinarily skilled person a starting point for selecting other candidates for preventing neutralization.

Moreover, appellants state in their specification that they are preventing neutralization of the photoacids caused by some undisclosed, undescribed agent or agents in the ambient atmosphere of a "clean" room after generation of photoacids in the resist but before the post etching baking. Appellants have conceded in their brief that the routineer would be left to a trial and error technique in order to find other "ambients" capable of preventing neutralization of the photoacids. Additionally, there is no disclosure in the

specification concerning the nature of photoacids generated by the irradiation step. Such information would have been useful to a person of ordinary skill seeking to find agents to prevent neutralization of the photoacids.

In reaching our decision, we have not overlooked the colloquy between the examiner and appellants concerning the meaning of the terminology "inert medium". However, whether the meaning of a term in a claim is definite or precise is an issue under 35 U.S.C. § 112, second paragraph, and we are not presented with any rejection of the claims under said statute. The issue which was presented for our review and which we have decided concerned the scope of the language "preventing said photoacid from being neutralized" and the corresponding scope of appellants' enabling disclosure.

The decision of the examiner is **AFFIRMED**.

No time period for taking any subsequent action in

connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

MARC L. CAROFF Administrative Patent Judge	)	
ANDREW H. METZ Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
ADRIENE LEPIANE HANLON Administrative Patent Judge	)	

AHM/gjh

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