

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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

33

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte DAVID NIN-KOU WANG,
JOHN M. WHITE, KAM S. LAW, CISSY LEUNG,
SALVADOR P. UMOTOY, KENNETH S. COLLINS,
JOHN A. ADAMIK, ILYA PERLOV, and DAN MAYDAN

Appeal No. 95-2347
Application No. 07/928,642¹

HEARD: Mar. 8, 1999

Before PAK, OWENS, and KRATZ, Administrative Patent Judges.
KRATZ, Administrative Patent Judge.

¹ Application for patent filed August 13, 1992. According to appellants, this application is a continuation of Application 07/537,445, filed June, 13, 1990; which is a continuation of Application 06/944,492, filed December 19, 1986, now Patent No. 5,000,113.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from the examiner's refusal to allow claims 5 and 6 as amended after the final rejection (see the amendment filed January 24, 1994, and the advisory action dated February 3, 1994). Claims 7, 22, and 54-56, which are the only other claims remaining (non-canceled) in this application, have been indicated as allowable by the examiner.

BACKGROUND

The appellants' invention relates to a reactor for processing wafers for use as semiconductor elements. An understanding of the invention can be derived from a reading of exemplary claim 5, which is reproduced below.

5. A semiconductor processing reactor comprising:

a housing defining a chamber therein including an inlet gas manifold oriented horizontally for supplying reactant gases to process a wafer within the chamber and beneath said manifold; the housing further including

a susceptor for supporting a wafer;

susceptor support means for holding the susceptor in a horizontal orientation;

means for selectively moving the susceptor support means vertically for positioning the susceptor and wafer parallel to the gas manifold at a plurality of selected positions closely adjacent the gas manifold, and further including

means for circulating fluid at a controlled temperature within the gas inlet manifold so as to maintain the internal surfaces of said gas manifold within a temperature range for suppressing condensation, decomposition and reaction of gases within said manifold and so as to maintain the external surfaces of said gas manifold at a higher temperature than said internal surfaces, said higher temperature sufficient to prevent formation of particulates on said external surfaces.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Davies et al. (Davies)	4,313,783	February 2, 1982
Chen et al. (Chen)	4,534,816	August 13, 1985
Shibata et al. (Shibata)	4,563,240	January 7, 1986
Shioya et al. (Shioya)	4,625,678	December 2, 1986
Kanai 1985	60-202937 (Japan)	October 14,

Claim 5 stands rejected under 35 U.S.C. § 103 as being unpatentable over Shibata in view of Kanai, Davies, and Shioya.

Claim 6 stands rejected under 35 U.S.C. § 103 as being unpatentable over Shibata in view of Kanai, Davies, and Shioya as above, and further in view of Chen.

Claims 5 and 6 stand rejected under 35 U.S.C. § 102/103 as unpatentable over Chen².

We make reference to the examiner's answer for the examiner's reasoning in support of the rejections, and to the appellants' brief (Paper No. 28, filed April 28, 1994) for the appellants' arguments thereagainst.

OPINION

² Although the final rejection mailed October 21, 1993 inadvertently failed to list 35 U.S.C. § 102 in addition to 35 U.S.C. § 103 in the statement of the rejection of claims 5 and 6 as being unpatentable over Chen, the Answer contains a statement of rejection which includes both 35 U.S.C. § 102 and § 103. Appellants did not request that the rejection be denominated as a new ground of rejection. Rather, they argue the rejection of claims 5 and 6 as unpatentable over Chen based on both 35 U.S.C. § 102 and § 103.

In reaching our decision in this appeal, we have given careful consideration to the appellants' specification and claims, to the applied prior art references, and to the respective positions articulated by the appellants and the examiner. As a consequence of our review, we find that we are in agreement with the examiner and will sustain the rejections.

REJECTION OF CLAIMS 5 AND 6 UNDER 35 U.S.C. § 102/103

According to the examiner (answer, page 5), Chen describes the reactor structure defined by claims 5 and 6³. In the examiner's view, the structure required by the claimed "means for circulating fluid..." has been taught by the gas manifold cooling means of Chen (answer, page 5).

³ We note that appellants have not furnished separate arguments regarding why claims 5 and 6 should not stand or fall together with respect to this rejection. Nor have appellants stated that these claims do not stand or fall together. Accordingly, we consider these claims to stand or fall together with respect to this rejection. See 37 CFR § 1.192(c)(5) (1993).

We note that appellants apparently agree with the examiner's application of Chen to the claimed reactor structure with the exception, according to appellants, that Chen does not disclose maintaining the interior surfaces of a gas manifold at a lower temperature than the temperature of exterior surfaces of the manifold (brief, page 10). However, appellants have not specifically pointed out how the claimed structure, including the "means for circulating fluid...", patentably differs from the structure of Chen that is being relied upon by the examiner including the cooling fluid circulating passageways 20, 22, 56, 66 and 68 described in column 5 of Chen.

We agree with the examiner's determination that the claimed and argued functional limitations regarding the relative temperatures of the gas manifold surfaces do not serve to patentably distinguish the underlying claimed structure from that of Chen. Clearly, as suggested by the examiner, the use of a plasma in the portion of the reactor of Chen below electrode (12) to etch a wafer, as described by Chen, would result in a

higher temperature adjacent the outer surfaces of the cooled gas manifold/electrode (12) than the temperatures of inner surfaces further removed from the plasma etching.

Based on the present record, we are in agreement with the examiner's conclusion that the circulating means called for by the claims do not structurally distinguish from the gas manifold/electrode cooling structure of Chen. We note that the claimed reactor has not been distinguished from the prior art based on claimed structural differences. In this regard, appellants argue possible distinctions in what the claimed device may do in performing a particular temperature maintenance operation (brief, page 10) rather than pointing out any specific patentable differences in the claimed structure itself. See Hewlett-Packard Co. v. Bausch & Lomb, Inc., 909 F.2d 1464, 1468, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990) and In re Danly, 263 F.2d 844, 848, 120 USPQ 528, 531 (CCPA 1959).

Accordingly, we agree with the examiner that the reactor structure defined by appealed claims 5 and 6 would have been anticipated under 35 U.S.C. § 102 or would have been rendered

obvious under 35 U.S.C. § 103 by the disclosed reactor structure of Chen. See In re Schreiber, 128 F.3d 1473, 1478, 44 USPQ2d, 1429, 1432 (Fed. Cir. 1997) and In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980).

REJECTION OF CLAIM 6 UNDER 35 U.S.C. § 103

Next, we consider the rejection of claim 6 under 35 U.S.C. § 103 as being unpatentable over Shibata taken with Kanai, Davies, Shioya, and Chen. We affirm based on the teachings of Chen for the reasons discussed above. In this regard, appellants' arguments at pages 9 and 10 of the brief are primarily directed to a particular temperature maintenance operation, which line of argument, in our view, is not convincing for the reasons discussed above.

REJECTION OF CLAIM 5 UNDER 35 U.S.C. § 103

We now turn to consideration of the rejection of claim 5 under 35 U.S.C. § 103 as being unpatentable over Shibata taken

with Kanai, Davies and Shioya. The examiner relies on Shibata for describing a reactor with a chamber having a plasma generation means for processing (etching) wafers that includes the claimed structure including a gas manifold/electrode (12) (fig. 1, col. 3, lines 10-17). The examiner acknowledges that Shibata does not describe temperature control structure for the gas manifold/electrode corresponding to the claimed "means for circulating fluid..." (answer, page 3). Kanai and Davies each disclose a plasma reactor used for etching that include channels for circulating cooling fluid through passageways in the electrodes (including gas manifold/electrodes) of a plasma generator to prevent the electrodes from overheating (Kanai, figures 9 and 10 and Davies, figure 3 and columns 3, 4 and 6)⁴. From the above collective teachings of the prior art, the examiner finds that it would have been obvious to one of ordinary skill in the art to provide the gas manifold/electrode of Shibata with cooling media passageways

⁴ Since we find that the teachings of Shibata, Kanai and Davies would have rendered the claimed invention herein obvious within the meaning of 35 U.S.C. § 103, we find it unnecessary to discuss Shioya in our decision.

for circulating a cooling medium to control the gas manifold/electrode temperature.

In our view, the provision of passageways for circulating a cooling fluid in the gas manifold/electrode (12) of Shibata would have been obvious to one of ordinary skill in the art to prevent excess temperatures from developing in the electrode/gas manifold of Shibata. Moreover, we agree with the examiner's conclusions (answer, pages 5-7), for reasons similar to those discussed above with regard to the rejection over Chen, that the claimed functional use limitations regarding the relative temperatures of the gas manifold surfaces do not serve to patentably distinguish the underlying claimed structure from that of the applied prior art. Thus, based on the present record, we agree with the examiner's conclusion that the claimed apparatus would have been obvious to one of ordinary skill in the art from the combined reference teachings.

Appellants argue that the reference (Shibata) "does not disclose any non-plasma reactor at all" (brief, page 7). We find this argument unconvincing. We note that Shibata discloses use of a plasma generation means (10) in reaction

vessel (17). Likewise, both Kanai and Davies are directed to reactors including plasma generation means.

Appellants appear to urge (brief, pages 7 and 8) that the reason or motivation to modify Shibata advanced by the examiner may be for a different purpose of preventing the overheating of the electrodes as discussed by Kanai and Davies, as opposed to solving the problems of the overheating of gases passing through the gas manifold/electrode and/or the problem of possible overcooling of outer surfaces thereof. However, this does not detract from the combinableness of the references. In this regard, it is not necessary that the prior art teaches the same purpose as appellants' for arriving at the claimed subject matter so long as a sufficient suggestion for or motivation to do so is furnished. See In re Dillon, 919 F.2d 688, 692, 16 USPQ2d 1897, 1900 (Fed. Cir. 1990), cert. denied, 500 U.S. 904 (1991) and In re Lintner, 458 F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972).

Accordingly, for the reasons advanced by the examiner as supplemented above, we agree with the examiner's conclusions regarding the obviousness under 35 U.S.C. § 103 of the claimed apparatus from the combined references teachings.

CONCLUSION

For the foregoing reasons, the examiner's rejections of claims 5 and 6 under 35 U.S.C. § 102 and 35 U.S.C. § 103 are affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

CHUNG K. PAK)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
TERRY J. OWENS)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
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PETER F. KRATZ)	
Administrative Patent Judge)	

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Patent Counsel
Applied Materials, Inc.
P.O. Box 450A
Santa Clara, CA 95052

APPEAL NO. - JUDGE KRATZ
APPLICATION NO. 07/928,642

APJ KRATZ

APJ PAK

APJ OWENS

DECISION: AFFIRMED

Prepared By: TINA

DRAFT TYPED: 30 Jan 01

FINAL TYPED: