

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. 36

UNITED STATES PATENT AND TRADEMARK OFFICE

---

BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

---

Ex parte HIROTAKA KIZUKI, NORIO HAYAFUJI and TATSUYA KIMURA

---

Appeal No. 1998-0097  
Application No. 08/513,036

---

ON BRIEF

---

Before GARRIS, PAK and KRATZ, Administrative Patent Judges.

GARRIS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal from the final rejection of claims 5, 7, 17 and 18. The only other claims remaining in the application, which are claims 1-4, 12, 13, 15, 16 and 21-26, have been allowed by the Examiner.

The subject matter on appeal relates to a method for producing a semiconductor device including dry etching an  $\text{Al}_x\text{Ga}_{1-x}\text{As}$  ( $0 \leq x \leq 1$ ) layer using a HCl gas, arsine gas, and hydrogen supplied at the same time with a partial pressure of

Appeal No. 1998-0097  
Application No. 08/513,036

the arsine gas in a range of from  $8 \times 10^{-3}$  Torr to 0.08 Torr and a flow ratio of the arsine gas to the HCl gas in a range of from 0.25 to 2.5. This appealed subject matter is adequately illustrated by independent claim 5 which reads as follows:

5. A method for producing a semiconductor device including dry etching an  $\text{Al}_x\text{Ga}_{1-x}\text{As}$  ( $0 \leq x \leq 1$ ) layer using a HCl gas, arsine gas, and hydrogen supplied at the same time with a partial pressure of the arsine gas in a range of from  $8 \times 10^{-3}$  Torr to 0.08 Torr and a flow ratio of the arsine gas to the HCl gas in a range of from 0.25 to 2.5.

The references relied upon by the Examiner as evidence of

obviousness are:

Heyen et al. (Heyen) "Vapor Phase Etching of GaAs in a Chlorine System", Journal of Crystal Growth, Vol. 53, pp. 558-162, (1981)

Van NT Blik et al. (Van NT Blik) "On the MOVPE Growth of Self-Aligned Laser Structures", Journal of Crystal Growth Vol. 92, pp. 165-170, (1988)

Menigaux et al. (Menigaux) 4,648,940 Mar. 10, 1987

All of the appealed claims stand rejected under the first paragraph of 35 U.S.C. § 112 as being based upon an original disclosure which fails to provide written description support for the invention now claimed.

Appeal No. 1998-0097  
Application No. 08/513,036

Claim 5 stands rejected under the 35 U.S.C. § 103 as being unpatentable over Heyen.

Finally, all of the appealed claims also stand rejected under the 35 U.S.C. § 103 as being unpatentable over Van NT Blik in view of Menigaux and Heyen.

We refer to the brief and reply brief and to the answer for a complete exposition of the opposing viewpoints expressed by the Appellants and by the Examiner concerning the above noted rejections.

#### OPINION

We will not sustain any of the rejections advanced by the Examiner in this appeal.

#### THE SECTION 112 REJECTION

It is the Examiner's basic position that the lower limit of 0.25 for the flow ratio range defined by each of the appealed claims is not supported by the written description of the Appellants' original disclosure as required by the first paragraph of § 112.

The test for determining compliance with the written description requirement is whether the disclosure of the

Appeal No. 1998-0097  
Application No. 08/513,036

application as originally filed reasonably conveys to the artisan that the inventor had possession at that time of the later claimed subject matter, rather than the presence or absence of literal support in the specification for the claim language. The contents of the drawings may also be considered in determining

Appeal No. 1998-0097  
Application No. 08/513,036

compliance with the written description requirement. In re Kaslow, 707 F.2d 1366, 1375, 217 USPQ 1089, 1096 (Fed. Cir. 1983).

In applying this test to the case at bar, we determine that the original disclosure of this application and in particular Figure 3a of the drawing would reasonably convey to an artisan that the Appellants had possession on the filing date of the now claimed subject matter which defines the flow ratio as including 0.25. Our reasons for this determination correspond to those set forth by the Appellants in their brief (e.g., see pages 9 and 10) and in their reply brief (e.g., see pages 2 and 3). That is, because Figure 3a of the Appellants' drawing reflects that an acceptable etch pit density in accordance with the Appellants' invention is obtained using a flow ratio as low 0.25, the originally filed disclosure of this application would reasonably convey to the artisan that the Appellants had possession of this last mentioned ratio at the time of application filing. Moreover, contrary to the Examiner's apparent belief, the fact that the conditions or parameters associated with Figure 3a are not necessarily required by the appealed claims is simply not relevant to the

Appeal No. 1998-0097  
Application No. 08/513,036

aforenoted test for determining written description compliance.

Under the circumstances recounted above, we cannot sustain the Examiner's § 112, first paragraph, rejection of claims 5, 7, 17 and 18 as lacking written description support in the originally filed disclosure of this application for the now claimed invention.

THE SECTION 103 REJECTIONS

Concerning the § 103 rejection of claim 5 over Heyen, the Examiner urges, inter alia, that it is routine in the art to optimize such parameters as the partial pressure for arsine gas and accordingly that it would have been obvious for one with ordinary skill in the art to so optimize this parameter in the method of Heyen to thereby obtain arsine gas partial pressures within the here claimed range. As indicated by the Appellants on page 12 of their brief, however, the partial pressure of arsine gas used by Heyen is disclosed in Figure 4 of the reference as being  $6 \times 10^{-3}$  bar which (according to the Appellants and not disputed by the Examiner) is equal to approximately 4.5 Torr and thus is orders of magnitude larger than the here claimed partial pressures of arsine gas.

Appeal No. 1998-0097  
Application No. 08/513,036

The fact that the arsine gas partial pressure used by Heyen in his method is far outside the here claimed range militates against the Examiner's conclusion that optimization of this parameter in Heyen's method would result in the Appellants' claimed values. In re Sebek, 465 F.2d 904, 906-07, 175 USPQ 93, 95 (CCPA 1972). Furthermore, although the Examiner in his rebuttal to the Appellants' arguments states that the Heyen reference "is not limited to the partial pressure shown in figure 4" (answer, page 8), he has proffered no specific evidence of any specific prior art partial pressures of any value much less values which are at least close to (and thus presumably would have suggested) those claimed by the Appellants.

In light of the foregoing, we also cannot sustain the Examiner's § 103 rejection of claim 5 as being unpatentable over Heyen.

As for the § 103 rejection based on Van NT Blik in view of Menigaux and Heyen, we consider it questionable at best whether the disparate teachings of the references would have been combined in the manner proposed by the Examiner by an



Appeal No. 1998-0097  
Application No. 08/513,036

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

jg

Appeal No. 1998-0097  
Application No. 08/513,036

LEYDIG VOIT AND MAYER  
SUITE 300  
700 THIRTEENTH STREET NW  
WASHINGTON, DC 20005