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D E C I S I O N
of 20 August 1998

Case Number: T 0016/96 - 3.4.1

Application Number: 92200433.8

Publication Number: 0504956

IPC: H01L 21/306

Language of the proceedings: EN

Title of invention:
Selective electrochemical etching

Applicant:
General Motors Corporation, et al

Opponent:
-

Headword:
Selective electrochemical etching/GENERAL MOTORS CO.

Relevant legal provisions:
EPC Art. 109, 113(1)
EPC R. 67

Keyword:
"Procedural violation (yes) - right to be heard"
"Obligation to grant interlocutory revision on appeal in a
clear case of procedural violation"

Decisions cited:
T 0139/87, T 0647/93, T 0898/86

Catchword:

-



Case Number: T 0016/96 - 3.4.1

D E C I S I O N
of the Technical Board of Appeal 3.4.1
of 20 August 1998

Appellant:

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Representative:

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Decision under appeal:

Decision of the Examining Division of the
European Patent Office posted 25 September 1995
refusing European patent application
No. 92 200 433.8 pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: G. Davies
Members: R. K. Shukla
G. Assi

Summary of Facts and Submissions

I. European patent application No. 92 200 433.8 claims the priority date of 15 March 1991 from a US patent application No. 670 119. During the examination of this European patent application, the Examining Division issued a communication, dated 31 March 1995, pursuant to Article 96(2) and Rule 51(2) EPC, which raised an objection to the grant of a patent on the basis of lack of novelty of claim 1 filed with the letter dated 24 January 1995, having regard to the following European patent application, which is comprised in the state of the art according to Article 54(3) and (4) EPC:

D2: EP-A-0 503 693.

Claim 1 filed with the letter dated 24 January 1995, forming the basis of the above communication reads as follows:

"A method of selectively etching from a body (18) of a semiconductor material having regions (20,22) of opposite conductivity type at least a portion of the region (20) of one conductivity type, the method including the steps of immersing the body (18) in a chemical etchant (14) which is capable of etching the semiconductor material and an oxide of the semiconductor material, a region or regions of the body (18) which is/are not to be etched being suitably protected from the chemical etchant; and connecting a first electrode (16) to the body (18) and immersing a

second electrode (28) in the chemical etchant and spaced from the body (18); characterised by the steps of applying a voltage between the body and the chemical etchant of a polarity suitable to form an oxide passivating layer on at least the surface of the region (20) of one conductivity type; and then removing the voltage for a long enough period of time so to etch away all of the passivating layer from the region (20) of one conductivity type and a portion of the region (20) of the one conductivity type."

In relation to the issue of novelty, it was stated in paragraph 4, sub-paragraph 2 of the above mentioned communication,

"It is noted that the subject-matter of present claim 1 does also not meet the requirement of novelty (Articles 52(1) and 54 EPC) with respect to document D2 disclosing a method where at a first applied voltage a passivation layer may also be formed on the p-type region and then, at e.g. 0 Volts, both the passivation and the p-type region are etched."

II. In response to the above communication, the applicant filed with a letter dated 21 June 1995 a new set of claims 1 to 10 to replace the claims then on file, claims 1 and 10 having the following wording:

Claim 1

"A method of selectively etching from a body (18) of a semiconductor material having regions (20,22) of

opposite conductivity type at least a portion of the region (20) of one conductivity type , characterised by the steps of immersing the body (18) in a chemical etchant (14); applying a voltage between the body (18) and the chemical etchant of a polarity suitable to form a passivating layer on a surface of each region (20,22) exposed to the chemical etchant; and etching the body (18) in the chemical etchant (14) by removing the voltage from between the body (18) and the chemical etchant (14) for a period of time long enough to etch away all of the passivating layer on the region (20) of the one conductivity type and a portion of the region (20) of the one conductivity type, but not long enough to remove all of the passivating layer from the region (22) of the other conductivity type; wherein the voltage is applied by immersing an electrode (28) in the chemical etchant (14) spaced from the body (18) and connecting the electrode and the body across a voltage source (30) to achieve the desired voltage."

Claim 10

"A method as claimed in any one of claims 1 to 9, in which the region (22) of the other conductivity type is initially isolated from the chemical etchant (14) by a masking layer (26a) which also covers a portion of the region (20) of the one conductivity type; wherein the method comprises the initial additional steps of immersing the body (18) in the chemical etchant (14); applying a voltage between the body and the chemical etchant of the polarity suitable to form a passivating layer on the surface of the region (20) of one conductivity type exposed to the chemical etchant;

etching away the passivating layer for a long enough period of time to remove all of the passivating layer from the region (20) of one conductivity type and a portion of the region of the one conductivity type; and repeating the above initial additional steps until a required area of the region of the one conductivity type is removed to expose the region (22) of the other conductivity type to the chemical etchant (14)."

[Emphasis added by the Board.]

III. In its decision dated 25 September 1995, the Examining Division refused the application on the ground that claim 10 (and also claim 1) filed with the letter dated 21 June 1995 lacked novelty having regard to the disclosure in document D2. In Section II, paragraph 1 of the above decision, it is stated, "Present claim 10 corresponds to claim 1 as filed with letter of 24.01.95. Accordingly, the objections raised in the communication of 31.03.95 with respect to claim 1 apply with equal force to present claim 10 ". In paragraph II.2 of the decision , detailed reasons are given for the finding of lack of novelty of the subject-matter of claims 10 and 1 in relation to document D2.

In respect of claim 1, it is stated in the decision under appeal, "In consequence, the subject-matter of claim 1, which by definition is more general than the subject-matter of dependent claim 10, does also not meet the requirements of novelty, Article 52(1) and 54(1)(3) and (4) EPC." [Emphasis added by the Board.]

IV. The applicants lodged an appeal on 13 October 1995

paying the appeal fee on the same day, and filed the statement of the grounds of appeal on 29 December 1995. The applicant requested that the decision to refuse the application be set aside, oral proceedings be appointed in the event that the arguments submitted in the statement of the grounds were deemed not to be persuasive, and the appeal fee be refunded on account of a procedural violation by the examining division.

The applicants submitted essentially the following arguments to support the allegation of procedural violation:

- (i) The statement in the " Grounds for the Decision " that current claim 10 corresponds to claim 1 filed with the letter of 24 January 1995 is wrong and fundamentally flawed. Claim 10 is dependent on claim 1. Claim 1 filed with the letter of 24 January 1995, on the other hand,
 - (a) does not include the steps of current claim 1, and in particular, does not include forming a passivating layer on **each** region (20,22) followed by etching for a period of time which is **not long enough to remove all of the passivating layer from the region (22) of the other conductivity type,** and
 - (b) does not include the final step of current claim 10 of repeating the initial steps until region (22) is exposed to the etchant.

As the examiner raised an objection to the present

claim 10 for the first time in the decision, there was a procedural violation, and the appeal fee should therefore be refunded.

Moreover, present claim 1 had been submitted for the first time with the letter of 21 June 1995, so that the examining division could not have, and had not, previously raised objections against this claim. As a consequence, the objection against this claim had been raised for the first time in the decision. As this was a procedural violation, a full refund of the appeal fee was requested.

- V. The Board after having examined the appeal on a preliminary basis, only in connection with the applicants' request for the refund of the appeal fee, informed the applicants that, in its provisional opinion, the decision under appeal did not comply with the requirement of Article 113(1) EPC, and that a substantial procedural violation had occurred which would justify setting aside the decision under appeal and remittal of the case to the department of the first instance. The applicants were, however, invited to state whether they wished the Board to carry out the examination of the substantive issues of the appeal having regard to the submissions made in the grounds of appeal, so as to avoid delaying a final decision, or whether they wished the case to be remitted to the first instance under Article 111 EPC for further examination, in order to avoid a loss of an instance of examination.

- VI. In response to the above communication, the applicants

requested in a letter dated 9 February 1998 that the case be referred back to the examining division.

Reasons for the Decision

1. The appeal is admissible.

2. *Procedural matters*

2.1 It is evident from the summary of the facts of the present case in paragraph II above that the decision to refuse the application was based on the ground that claim 10, and also claim 1, lacked novelty having regard to document D2. As mentioned above, in paragraph II.1 of the decision under appeal, it is stated that "Present claim 10 corresponds to claim 1 as filed with letter of 24.01.95. Accordingly, the objections raised in the communication of 31.01.95 with respect to claim 1 apply with equal force to present claim 10" [emphasis added by the Board]. It is clear that in the decision under appeal, the term "corresponds" has been used to mean that the subject-matter of claim 10 is essentially the same as that of claim 1. Present claim 10 is, however, dependent on claim 1, and consequently includes all the features of the latter claim (see paragraph II above). It is also acknowledged in the decision under appeal that claim 10 was a dependent claim (see paragraph III, last subparagraph above). In particular, claim 10 includes the requirement of claim 1 that (a) a voltage is applied to form a passivating layer on a surface of each region

(20,22) exposed to the chemical etchant and that (b) during the etching step, the period for which the voltage is removed is not long enough to remove all of the passivating layer from the region (22) of the other conductivity type [emphasis added by the Board]. Moreover, according to claim 10, (c) the initial additional steps as set out therein are repeated until an area of one conductivity type is removed to expose the region (22) of the other conductivity type to the chemical etchant.

A comparison of claim 1, dated 24 January 1995 (see paragraph I above) with claim 10 shows that, the former does not include the features (a), (b) and (c) of claim 10. Consequently, whereas the detailed reasoning for the finding of lack of novelty in respect of claim 10 in the decision under appeal (see paragraph II.2 of the decision under appeal) deals with all the above features, the objection of lack of novelty raised in the communication dated 31 March 1995 (see paragraph I, last sub-paragraph above) in respect of claim 1, dated 24 January 1995, did not deal with these features.

In view of the above, the Board agrees with the applicants that the statement in paragraph II.1 of the decision under appeal regarding claim 10 is factually wrong. Consequently, the conclusion that the objection of lack of novelty raised in connection with claim 1, dated 24 January 1995 in the communication, dated 31 March 1995, applies to claim 10 is also flawed. The Board, therefore, agrees with the applicants that this objection, including the factual reasoning leading to the objection of lack of novelty, was raised against the subject-matter of claim 10 for the first time in the decision under appeal. The applicants have had, therefore, no opportunity to present their comments on this objection.

Furthermore, as the application was refused on the ground that claim 10 lacked novelty, the decision under appeal was based on a ground on which the applicants have had no opportunity to present their comments, contrary to the requirement of Article 113(1) EPC. The decision under appeal has, therefore, to be set aside. Moreover, as the requirement of Article 113(1) represents a fundamental procedural principle ensuring the right (of a party to the proceedings) to be heard before an adverse decision is issued, its violation amounts to a substantial procedural violation justifying the refund of the appeal fee in accordance with Rule 67 EPC. This is irrespective of whether or not such a violation occurred due to an inadvertent mistake or an error of judgment on the part of the department issuing the decision.

2.2 Moreover, in respect of claim 1 filed with the applicants' letter dated 21 June 1995 forming the basis of the decision under appeal, a comparison of this claim with claim 1 dated 24 January 1995 shows that the former claim contains the step of etching the body (18) for a period which is "not long enough to remove all of the passivating layer from the region (22) of the other conductivity type" (see paragraph II above), and that such an etching step was not in the latter claim 1. Furthermore, an examination of the file record of the present application shows that the subject-matter of claim 1 in its totality, forming the basis of the decision, was presented for the first time with the applicants' letter dated 21 June 1995, and as a consequence, the objection of lack of novelty against such a claim was raised for the first time in the decision under appeal, contrary to the requirement of Article 113(1) EPC.

2.3 The examining division did not avail itself of the opportunity of granting interlocutory revision under Article 109(1) EPC (and resume the examination) even though it was pointed out on appeal by the applicants that the decision was based on wrong facts. Under such circumstances when the decision was evidently based on wrong facts, and, consequently, the applicants' right to present comments according to Article 113(1) EPC were clearly not respected, in the Board's view, the appeal was well founded within the meaning of Article 109(1) EPC. Under such circumstances, according to the established case law of the boards of appeal, there was an obligation on the part of the examining division to rectify its decision by way of an

interlocutory revision and resume the examination (see T 139/87, OJ EPO 1990, 68; T 647/93, OJ EPO 1995, 132 and T 898/96 of 10 January 1997).

3. As the applicants have requested that the case be referred back to the examining division, the Board in the exercise of its powers under the provisions of Article 111(1) EPC remits the case to the department of the first instance for further prosecution of the application on the basis of the applicants' submissions made in the statement of the grounds of appeal.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The appeal fee shall be refunded.
3. The case is remitted to the department of the first instance for further prosecution.

The Registrar: The Chairman:

M. Beer

G. Davies