



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification ⁵ : H01L 21/316, 39/24, C23C 14/22</p>	A3	<p>(11) International Publication Number: WO 91/06976</p> <p>(43) International Publication Date: 16 May 1991 (16.05.91)</p>
<p>(21) International Application Number: PCT/US90/06391</p> <p>(22) International Filing Date: 6 November 1990 (06.11.90)</p> <p>(30) Priority data: 432,931 7 November 1989 (07.11.89) US</p> <p>(71) Applicant: DEPARTMENT OF THE NAVY [US/US]; Naval Weapons Center (code 006), China Lake, CA 93555-6001 (US).</p> <p>(72) Inventors: GREEN, Arold, K. ; 123 Diamond Peak, Ridgecrest, CA 93555 (US). REHN, Victor, L. ; 819 Mamie, Ridgecrest, CA 93555 (US). SCWARTZ, Carey ; 123 N. American, Ridgecrest, CA 93555 (US).</p> <p>(74) Agents: SHEINBEIN, Sol et al.; Office of Counsel (Code 006), Naval Weapons Center, China Lake, CA 93555-6001 (US).</p>		<p>(81) Designated States: AT (European patent), AU, BB, BE (European patent), BF (OAPI patent), BG, BJ (OAPI patent), BR, CA, CF (OAPI patent), CG (OAPI patent), CH (European patent), CM (OAPI patent), DE (European patent), DK, DK (European patent), ES, ES (European patent), FI, FR (European patent), GA (OAPI patent), GB (European patent), GR (European patent), IT (European patent), JP, KP, KR, LK, LU, LU (European patent), MC, MG, ML (OAPI patent), MR (OAPI patent), MW, NL, NL (European patent), NO, RO, SD, SE, SE (European patent), SN (OAPI patent), SU, TD (OAPI patent), TG (OAPI patent).</p> <p>Published <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i></p> <p>(88) Date of publication of the international search report: 8 August 1991 (08.08.91)</p>
<p>(54) Title: PROCESS FOR PRODUCING AN ALUMINUM OXIDE LAYER ON VARIOUS SUBSTRATES</p>		
<p>(57) Abstract</p> <p>A process for producing an electrically insulating and protective layer of aluminum oxide on semiconductive, insulating, metallic and superconductive substrates is disclosed, which comprises forming an epitaxial or polycrystalline film of aluminum arsenide on the surface of the substrate, e.g. a gallium arsenide substrate, and exposing the aluminum arsenide coated substrate, e.g. gallium arsenide, to water vapor, e.g. the ambient atmosphere containing water vapor, at a sufficient water vapor pressure and for a period of time sufficient to substantially completely convert the aluminum arsenide to aluminum oxide.</p>		

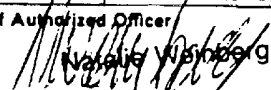
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INTERNATIONAL SEARCH REPORT

International Application No PCT/US 90/06391

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ⁶		
According to International Patent Classification (IPC) or to both National Classification and IPC		
IPC ⁵ : H 01 L 21/316, H 01 L 39/24, C 23 C 14/22		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
IPC ⁵	H 01 L	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸		
III. DOCUMENTS CONSIDERED TO BE RELEVANT ⁹		
Category ¹⁰	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
X	EP, A, 0008898 (WESTERN ELECTRIC CORP.) 19 March 1980 see claims 1-4, 7-9	1-5
A	--	6-8
X	US, A, 4291327 (WON-TIEN TSANG) 22 September 1981 see column 3, lines 37-60	1-5
A	--	6-8
X	Journal Vacuum Science & Technology, vol. 20, no. 3, March 1982, American Vacuum Society, J.A. Taylor: "An XPS study of the oxidation of AlAs films grown by MBE", pages 751-755 see the whole article -----	1-4
<p>¹⁰ Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&" document member of the same patent family</p>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
22nd February 1991	04. 07. 91	
International Searching Authority	Signature of Authorized Officer	
EUROPEAN PATENT OFFICE	 Natalia Weyenberg	

FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET

V. OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE ¹

This international search report has not been established in respect of certain claims under Article 17(2) (a) for the following reasons:

1. Claim numbers because they relate to subject matter not required to be searched by this Authority, namely:

2. Claim numbers because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claim numbers because they are dependent claims and are not drafted in accordance with the second and third sentences of PCT Rule 6.4(a).

VI. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING ²

This International Searching Authority found multiple inventions in this international application as follows:

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims of the international application.
2. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims of the international application for which fees were paid, specifically claims:

3. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers:
Claim nos. 1-8, 31-34
4. As all searchable claims could be searched without effort justifying an additional fee, the International Searching Authority did not invite payment of any additional fee.

Remark on Protest

- The additional search fees were accompanied by applicant's protest.
 No protest accompanied the payment of additional search fees.

**ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO.**

US 9006391
SA 42721

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 18/06/91. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP-A- 0008898	19-03-80	US-A- 4216036	05-08-80
		CA-A- 1121520	06-04-82
		WO-A- 8000521	20-03-80
		US-A- 4291327	22-09-81

US-A- 4291327	22-09-81	US-A- 4216036	05-08-80
		CA-A- 1121520	06-04-82
		EP-A, B 0008898	19-03-80
		WO-A- 8000521	20-03-80

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82