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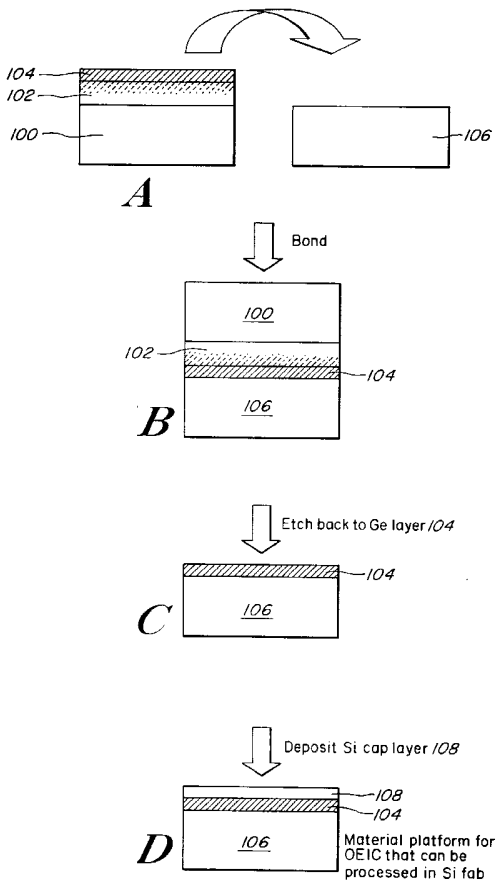
[Continued on next page]

(54) Title: SILICON WAFER WITH EMBEDDED OPTOELECTRONIC MATERIAL FOR MONOLITHIC OEIC



(57) Abstract: A structure with an optically active layer embedded in a Si wafer, such that the outermost epitaxial layer exposed to the CMOS processing equipment is always Si or another CMOS-compatible material such as SiO_2. Since the optoelectronic layer is completely surrounded by Si, the wafer is fully compatible with standard Si CMOS manufacturing. For wavelengths of light longer than the bandgap of Si (1.1 μm), Si is completely transparent and therefore optical signals can be transmitted between the embedded optoelectronic layer and an external waveguide using either normal incidence (through the Si substrate or top Si cap layer) or in-plane incidence (edge coupling).

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 01/24075

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H01S5/02 H01L27/15

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H01L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, PAJ, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	page 4, line 17-25 page 12, line 1-18; figure 4	1,17,25
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A	WO 98 59365 A (MASSACHUSETTS INST TECHNOLOGY) 30 December 1998 (1998-12-30) cited in the application the whole document	1-58

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
13 March 2003	21/03/2003

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Claessen, L

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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