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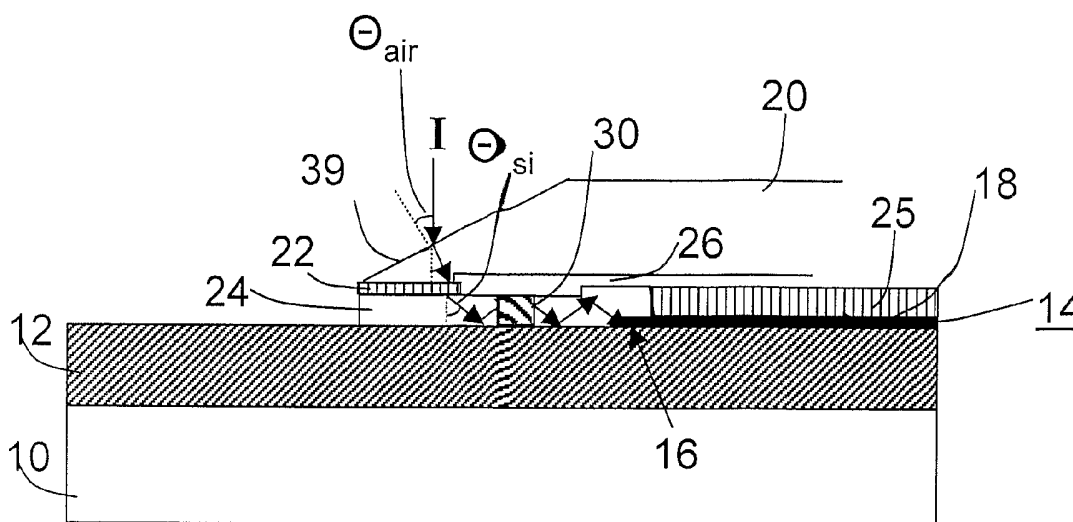
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[Continued on next page]

(54) Title: SILICON NANOTAPER COUPLERS AND MODE-MATCHING DEVICES



(57) Abstract: An optical coupling arrangement including an ultrathin silicon waveguide (18) formed in an upper silicon layer (14) of a silicon-on-insulator (SOI) structure and a silicon nanotaper structure (16) formed in the upper silicon layer and coupled to the ultrathin silicon waveguide. A dielectric waveguide coupling layer (24), with a refractive index greater than that of the dielectric insulating layer but less than that of silicon, overlies a portion of the dielectric insulating layer (12) where an associated portion of the SOI layer has been removed. An end portion of the dielectric waveguide coupling layer overlaps an end section of the silicon nanotaper to form a mode conversion region (26). A free-space optical coupling arrangement (such as a prism (22) or grating) is disposed over the dielectric waveguide coupling layer and used to couple a propagating free space signal to the dielectric waveguide coupling layer and thereafter into the ultrathin silicon waveguide.

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INTERNATIONAL SEARCH REPORT

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<p>A. CLASSIFICATION OF SUBJECT MATTER IPC(7) : G02B 6/14,34 US CL : 385/36,37,39,43 According to International Patent Classification (IPC) or to both national classification and IPC</p>														
<p>B. FIELDS SEARCHED</p> <p>Minimum documentation searched (classification system followed by classification symbols) U.S. : 385/33,50,129-132</p> <p>Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched none</p> <p>Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) Please See Continuation Sheet</p>														
<p>C. DOCUMENTS CONSIDERED TO BE RELEVANT</p> <table border="1"> <thead> <tr> <th>Category *</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>X,P</td> <td>US 2004/0057667 A1 (YAMADA et al) 25 March 2004 (25.03.2004), Figures 1A, 1B, 2D, 2F, Paragraphs [0044]-[0052].</td> <td>13</td> </tr> <tr> <td>X</td> <td>US 2003/0044118 A1 (ZHOU et al) 06 March 2003 (06.03.2003), Paragraph [0188], Figure 13.</td> <td>13-14</td> </tr> <tr> <td>A</td> <td>US 2003/0039430 A1 (DELIWALA) 27 February 2003 (27.02.2003), Figures 52-58.</td> <td>1-12</td> </tr> </tbody> </table>			Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	X,P	US 2004/0057667 A1 (YAMADA et al) 25 March 2004 (25.03.2004), Figures 1A, 1B, 2D, 2F, Paragraphs [0044]-[0052].	13	X	US 2003/0044118 A1 (ZHOU et al) 06 March 2003 (06.03.2003), Paragraph [0188], Figure 13.	13-14	A	US 2003/0039430 A1 (DELIWALA) 27 February 2003 (27.02.2003), Figures 52-58.	1-12
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<p>Date of the actual completion of the international search 27 June 2005 (27.06.2005)</p>		<p>Date of mailing of the international search report 03 OCT 2005</p>												
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INTERNATIONAL SEARCH REPORT

International application No.

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Continuation of B. FIELDS SEARCHED Item 3:
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