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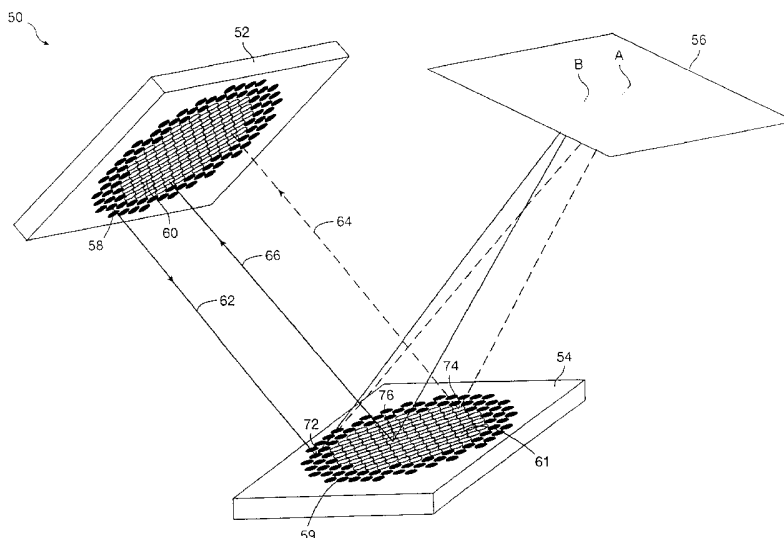
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(54) Title: THREE-DIMENSIONAL OPTICAL SWITCH WITH ANNULAR INPUT/OUTPUT PORTS



(57) Abstract: In a folded three-dimensional free-space optical switch including a set of fibers and an optical system for producing collimated beamlets aligned to intersect an array of dual axis micromirrors of coplanar input and output mirror elements, and a folding mirror, the input and output micromirrors are arranged in a pattern wherein either the input or output mirror set is disposed along an annulus and wherein the complementary output or input mirror set is disposed within the annulus in order to globally minimize maximum tilt angles for a two-dimensional locus of tilt angles of the micromirror set. The beamlets are routed from assigned input fibers to corresponding input moveable mirrors to assigned output fibers via the static folding mirror and corresponding output moveable mirrors.

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*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/31811

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(7) : G02B 6/35  
 US CL : 385/18

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)  
 U.S. : 385/16-24

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
 NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
 Please See Continuation Sheet

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,P	US 6,507,683 B2 (SUGITATSU et al) 14 January 2003 (14.01.2003), Figures 4, 12; column 1, lines 44-65; column 5, lines 8-47.	1-9
A,E	US 6,728,016 B1 (HUNT et al) 27 April 2004 (27.04.2004), see entire document.	1-12
A,P	US 2002/0164114 A1 (GOLUB et al) 07 November 2002 (07.11.2002), see entire document.	1-12
A,P	US 6,587,611 B1 (HUNT) 01 July 2003 (01.07.2003), see entire document.	1-12
A,E	US 6,690,885 B1 (AKSYUK et al) 10 February 2004 (10.02.2004), see entire document.	1-12

Further documents are listed in the continuation of Box C.

See patent family annex.

\* Special categories of cited documents:

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"&" document member of the same patent family

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# INTERNATIONAL SEARCH REPORT

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**Continuation of B. FIELDS SEARCHED Item 3:**

EAST: USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM\_TDB

search terms: (385/16-24).CCLS.; ((385/16-24.CCLS.) and ((mirror or mirrors or micromirror or micromirrors or micro-mirror or micro-mirrors or reflector or reflectors) with annulus)