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FILING DATE: *September 01, 2006*
PATENT NUMBER: *7,664,395*
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R. PONDEXTER
Certifying Officer

UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

First Named Inventor	Melanie Holmes
Express Mail Label No.	EV 214902601 US

Title of Invention: OPTICAL PROCESSING

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

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1. [ ] Fee Transmittal Form
(Submit an original and a duplicate for fee processing)
2. [X] Specification **Total Pages** [100]
Both the claims and the abstract must start on a new page
(For information on the preferred arrangement, see MPEP 608.01(a))
3. [X] Drawing(s) (35 U.S.C. 113) **Total Sheets [36]**
[X] Fig. of the Drawings for Publication [13b]
[ ] No Figure to be Published
4. [ ] Oath or Declaration **Total Pages [ ]**
a. [ ] Newly executed (original or copy)
b. [ ] Copy from a prior application (37 C.F.R. 1.63(d))
(for continuation/divisional with Box 18 completed)
i. [ ] DELETION OF INVENTOR(S)
Signed statement attached deleting inventor(s) named in the prior application, see 37 C.F.R. 1.63(d)(2) and 1.33(b).
5. [ ] CD-ROM or CD-R in duplicate, large table or Computer Program *(Appendix)*
6. [ ] Nucleotide and/or Amino Acid Sequence Submission
(if applicable, items a.-c. are required)
a. [ ] Computer Readable Form (CRF)
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ii. [ ] Transfer Request (37 CFR 1.821(e))
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ii. [ ] Paper [ ] **Pages**
c. [ ] Statements verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

7. [ ] Assignment Papers (cover sheet & documents)
Name of Assignee Thomas Swan & Co. Ltd.
City & State: Durham, United Kingdom
8. [ ] 37 CFR 3.73(b) Statement [ ] Power of Attorney
(when there is an assignee)
9. [ ] English Translation Document *(if applicable)*
10. [X] Information Disclosure Statement *(PTO-1449)*
[ ] Copies of foreign patent documents, publications, and other information
11. [ ] Preliminary Amendment
12. [X] Return Receipt Postcard
13a. [ ] Foreign Priority Claim under 35 U.S.C. § 119 or 365
13b. [ ] Certified Copy of Priority Document(s)
14. [ ] Nonpublication Request under 35 U.S.C. 122(b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent.
15. [X] Remarks
16. [ ] Small Entity Statement(s)
17. [ ] Other

18. **If a CONTINUING APPLICATION,** check appropriate box, and supply the requisite information below and in the first sentence of the specification following the title:

[ ] Continuation [X] Divisional [ ] Continuation-in-part (CIP) of prior application No.: 10/487,810

Prior application information: Examiner: Loha Ben Group Art Unit: 2873

The entire disclosure of the prior application is considered a part of the disclosure of the accompanying application and is hereby incorporated by reference.
(Add standard Related Applications section with incorporation by reference to specification or update same)

19. CORRESPONDENCE ADDRESS

NAME	Customer No. 021005				
	HAMILTON, BROOK, SMITH & REYNOLDS, P.C.				
ADDRESS	530 Virginia Road, P.O. Box 9133				
CITY	Concord	STATE	MA	ZIP CODE	01742-9133
COUNTRY	USA	TELEPHONE	(978) 341-0036	FAX	(978) 341-0136

Signature		Date	9/1/06
Submitted by Typed or Printed Name	Timothy J. Meagher	Reg. Number	39,302

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Melanie Holmes

Divisional Application of

Application No.: 10/487,810

371C File Date: September 10, 2004

For: OPTICAL PROCESSING

Date: 9/1/06

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REMARKS

Commissioner for Patents
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Sir:

The above-captioned application is a divisional of application number 10/487,810 to which priority is claimed under 35 U.S.C. §120.

The specification of the present application is substantially the same as that of the parent application. The related applications paragraph has been revised to include a specific reference to the parent application.

Claims 19-21 and 23-27 as presented in the parent application have been renumbered sequentially beginning with Claim 1. A newly executed declaration under 37 C.F.R. 1.63 is not believed to be necessary under 37 C.F.R. 1.63(d) or 1.67(b).

Respectfully submitted,

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

By _____
Timothy J. Meagher
Registration No. 39,302
Telephone: (978) 341-0036
Facsimile: (978) 341-0136

Concord, MA 01742-9133
Dated: 9/1/6

Date: 9/1/06 Express Mail Label No EV214902601US

Inventor: Melanie Holmes

Attorney's Docket No.: 3274.1003-002

OPTICAL PROCESSING

RELATED APPLICATIONS

This application is a divisional of U.S. Appl. No. 10/487,810, which is the U.S. National Stage of International Appl. No. PCT/GB02/04011, filed September 2, 2002, and published in English. This application claims priority under 35 U.S.C. § 119 or 365 to Great Britain Appl. No. 0121308.1, filed September 3, 2001. The entire teachings of the above application(s) are incorporated herein by reference.

FIELD OF THE INVENTION

[0001] The present invention relates to an optical device and to a method of controlling an optical device.

[0002] More particularly but not exclusively the invention relates to the general field of controlling one or more light beams by the use of electronically controlled devices. The field of application is mainly envisaged as being to fields in which reconfiguration between inputs and outputs is likely, and stability of performance is a significant requirement.

BACKGROUND OF THE INVENTION

[0003] It has previously been proposed to use so-called spatial light modulators to control the routing of light beams within an optical system, for instance from selected ones of a number of input optical fibres to selected ones of output fibres.

[0004] Optical systems are subject to performance impairments resulting from

aberrations, phase distortions and component misalignment. An example is a multiway fibre connector, which although conceptually simple can often be a critical source of system failure or insertion loss due to the very tight alignment tolerances for optical fibres, especially for single-mode optical fibres. Every time a fibre connector is connected, it may provide a different alignment error. Another example is an optical switch in which aberrations, phase distortions and component misalignments result in poor optical coupling efficiency into the intended output optical fibres. This in turn may lead to high insertion loss. The aberrated propagating waves may diffract into intensity fluctuations creating significant unwanted coupling of light into other output optical fibres, leading to levels of crosstalk that impede operation. In some cases, particularly where long path lengths are involved, the component misalignment may occur due to ageing or temperature effects.

[0005] Some prior systems seek to meet such problems by use of expensive components. For example in a communications context, known free-space wavelength multiplexers and demultiplexers use expensive thermally stable opto-mechanics to cope with the problems associated with long path lengths.

[0006] Certain optical systems have a requirement for reconfigurability. Such reconfigurable systems include optical switches, add/drop multiplexers and other optical routing systems where the mapping of signals from input ports to output ports is dynamic. In such systems the path-dependent losses, aberrations and phase distortions encountered by optical beams may vary from beam to beam according to the route taken by the beam through the system. Therefore the path-dependent loss, aberrations and phase distortions may vary for each input beam or as a function of the required output port.

[0007] The prior art does not adequately address this situation.

[0008] Other optical systems are static in terms of input/output configuration. In such systems, effects such as assembly errors, manufacturing tolerances in the optics and also changes in the system behaviour due to temperature and ageing, create the desirability for dynamic direction control, aberration correction, phase distortion compensation or misalignment compensation.

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