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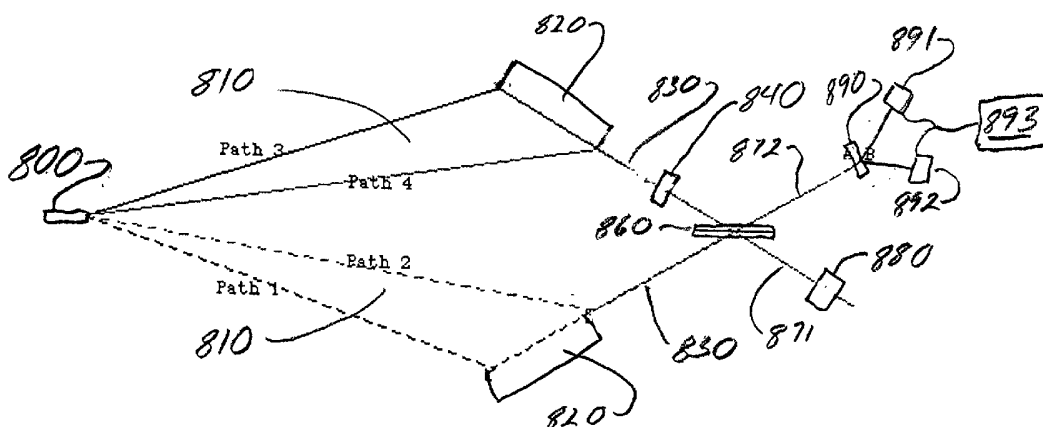
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(54) Title: INTERFEROMETRIC SOURCE OF MULTI-COLOR, MULTI-BEAM ENTAGLED PHOTONS



(57) Abstract: Systems and methods are described for a quantum channel for the transmission of information. A method includes: down converting a beam of coherent energy to provide a beam of multi-color entangled photons (810); converging two spatially resolved portions of the beam of multi-color entangled photons into a converged multi-color entangled photon beam (830); changing a phase of at least a portion of the converged multi-color entangled photon beam; combining the first interferometric multi-color entangled photon beam with a second interferometric multi-color entangled photon beam within a single beam splitter 860; wherein combining includes erasing energy and momentum characteristics from both the first interferometric multi-color entangled photon beam and the second interferometric multi-color entangled photon beam; splitting the first interferometric multi-color entangled photon beam and the second interferometric multi-color entangled photon beam within the single beam splitter 860, wherein splitting yields a first output beam of multi-color entangled photons 871 and a second output beam of multi-color entangled photons 871; and modulating the first output beam of multi-color entangled photons 871.



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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

Interr Application No
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A. CLASSIFICATION OF SUBJECT MATTER
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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)
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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)

INSPEC, EPO-Internal, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	RARITY J G ET AL: "Two-color photons and nonlocality in fourth-order interference" PHYSICAL REVIEW A (ATOMIC, MOLECULAR, AND OPTICAL PHYSICS), 1 MAY 1990, USA, vol. 41, no. 9, pages 5139-5146, XP002233565 ISSN: 0556-2791 cited in the application abstract	1,8
A	LARCHUK T S ET AL: "Interfering entangled photons of different colors" PHYSICAL REVIEW LETTERS, 15 MARCH 1993, USA, vol. 70, no. 11, pages 1603-1606, XP002233566 ISSN: 0031-9007 abstract	1,8

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	SHIMIZU KAORU ET AL: "Quantum communication with a 2-bit message coding for each transmitted photon" TECHNICAL DIGEST. CLEO/PACIFIC RIM. THE PACIFIC RIM CONFERENCE ON LASERS AND ELECTRO-OPTICS, XX, XX, 1997, pages 79-80, XP002112182 figure 1	1,8
A	YOUNG-HO KIM ET AL: "Bell-state preparation using pulsed nondegenerate two-photon entanglement" PHYSICAL REVIEW A (ATOMIC, MOLECULAR, AND OPTICAL PHYSICS), JUNE 2001, APS THROUGH AIP, USA, vol. 63, no. 6, pages 060301/1-4, XP002233567 ISSN: 1050-2947 abstract	1,8