

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
6 May 2004 (06.05.2004)

PCT

(10) International Publication Number  
**WO 2004/038849 A1**

(51) International Patent Classification<sup>7</sup>: **H01P 1/18**, 1/22

(21) International Application Number:  
PCT/EP2003/013336

(22) International Filing Date: 24 October 2003 (24.10.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
0224911.8 25 October 2002 (25.10.2002) GB

(71) Applicant (*for all designated States except US*): **AGENCE SPATIALE EUROPEENNE** [FR/FR]; 8-10, rue Mario Nikis, F-75738 PARIS FRANCE (FR).

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): **CASTIGLIONE, Dario, Calogero** [GB/GB]; 33 Stanhope Road, Reading, Berkshire RG2 7HW (GB). **DEIAS, Luisa** [IT/IT]; Via Forlanini 28, I-09126 Cagliari (IT). **EDERRA-URZAINQUI, Inigo** [ES/ES]; Burgiberria 37, 31417 Isaba (ES).

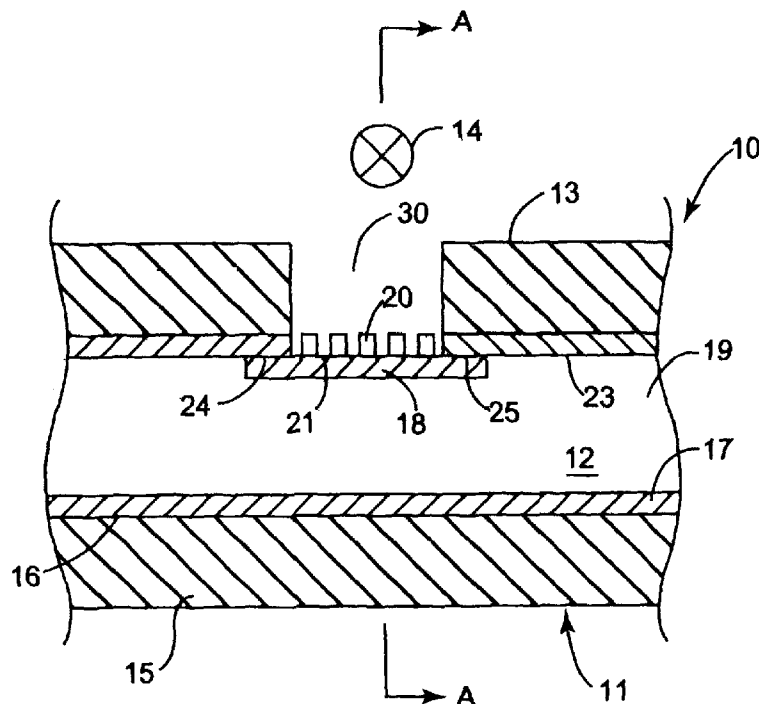
**HASKETT, David, Brian** [IE/IE]; 4 Groody Student Park, Groody Roundabout, Castletroy, Limerick (IE). **JENKINS, Derek** [GB/GB]; 56 Uphorpe Drive, Wantage, Oxon OX12 7DG (GB). **LAISNE, Alexandre, Vincent, Samuel, Bernard** [FR/FR]; 6 La Haguille, F-50300 Vains (FR). **McCALDEN, Alec, John** [GB/GB]; 127 Kings Road, Farncombe, Surrey GU7 3EU (GB). **O'NEILL, James, Peter** [IE/GB]; 44 Welbeck Road, Sheffield S6 5AY (GB). **TENIENTE-VALLINAS, Jorge** [ES/ES]; C/Paseo Central, 23, E-31580 Lodosa (ES). **VAN DE WATER, Frank** [NL/NL]; De Louw 9, NL-5583 GP Waalre (NL). **ZINN, Alfred, A** [DE/DE]; Beethovenring 90, 64342 Seeheim-Jugenheim (DE). **DE MAAGT, Peter** [NL/NL]; Zeewinde 45, NL-2224 GL Katwijk (NL). **MANN, Chris** [GB/GB]; Lanherne Cottage, St Mawgan, Cornwall TR8 4ET (GB).

(74) Agent: **CABINET ORES**; 36, rue de St Petersburg, F-75008 Paris (FR).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE,

[Continued on next page]

(54) Title: TUNEABLE PHASE SHIFTER AND/OR ATTENUATOR



(57) Abstract: The invention relates to a tuneable phase shifter and/or attenuator comprising a waveguide having a channel and a piece of photo-responsive material (18) disposed within the waveguide along an internal wall of said channel, a light source disposed outside the waveguide to emit light through an aperture (30) of said internal wall to impinge on at least part of an outside surface of said piece of photo-responsive material (18).

WO 2004/038849 A1



GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

- (84) **Designated States (regional):** ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Declaration under Rule 4.17:**

- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations*

**Published:**

- *with international search report*  
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

*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.*