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(71) Applicant (for all designated States except US):  
**GALAYOR NETWORKS INC.** [US/US]; P.O.Box  
6695, Ithaca, NY 14851 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **HARONIAN, Dan** [IL/IL]; Netzah Yerushalayim 15, 90435 Efrat (IL).  
**VERED, Ran** [IL/IL]; House No. 126, 49950 Nehalim

(IL). **EFRON, Eitan** [IL/IL]; House No. 20, 45886 Yaaf  
(IL). **COHEN, Rahav** [IL/IL]; Haprachim Street 8A,  
43399 Raanana (IL).

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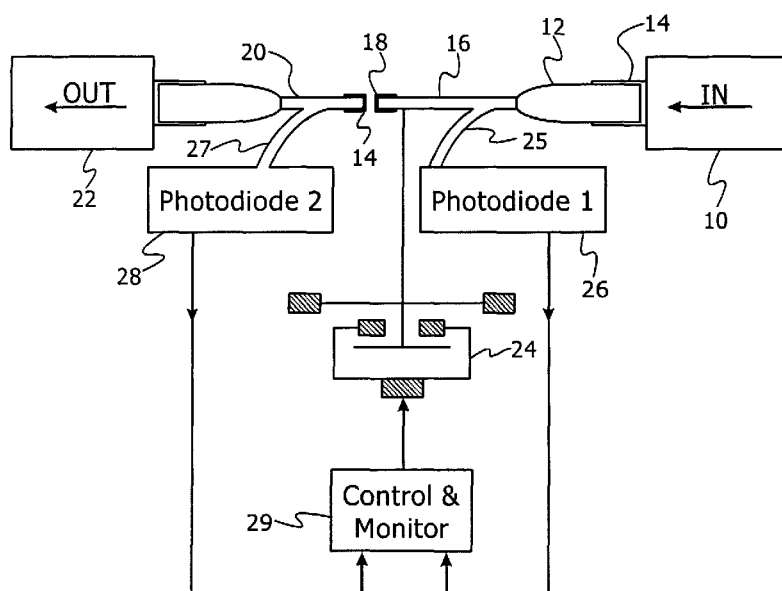
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(54) Title: MONOLITHIC OPTICAL CONTROL COMPONENTS



(57) Abstract: Novel optical waveguide components, operated by means of micro-actuators which move suspended section of waveguides, and especially variable optical attenuators, and optical couplers. Methods are also described for aligning and latching the micro-actuators in two or three dimensions, such that settings of variable attenuators can be maintained. Such micro-actuators are also used for ensuring good alignment between the various waveguide and fiber ports in integrated optical circuits. Additional components based on micro-actuators include multi-pole switches, digital variable optical attenuators, receiver input protectors, and multifunctional line protection chips. The components and systems described can be executed in monolithic form, thus engendering significant cost and space savings. Furthermore, methods of substrate etching to obtain accurately vertical faces are also described.











































































































































































