



US 20030108274A1

(19) **United States**(12) **Patent Application Publication**
Haronian(10) **Pub. No.: US 2003/0108274 A1**(43) **Pub. Date: Jun. 12, 2003**(54) **MODE COUPLED OPTOMECHANICAL DEVICES****Publication Classification**(76) Inventor: **Dan Haronian, Jerusalem (IL)**(51) **Int. Cl.⁷** **G02B 6/35; G02B 6/26; G02B 6/293**(52) **U.S. Cl.** **385/17; 385/16; 385/50; 385/24**

Correspondence Address:

LADAS & PARRY**26 WEST 61ST STREET****NEW YORK, NY 10023 (US)**(57) **ABSTRACT**(21) Appl. No.: **10/111,181**(22) PCT Filed: **Aug. 22, 2001**(86) PCT No.: **PCT/IL01/00787****Related U.S. Application Data**

(60) Provisional application No. 60/275,986, filed on Mar. 14, 2001. Provisional application No. 60/275,968, filed on Mar. 15, 2001.

(30) **Foreign Application Priority Data**

Aug. 22, 2000 (IL) 138014

An optomechanical device, based on mode coupling, and methods for its use. Two waveguides cross each other and a movable suspended coupler is located at the cross-over, such that on activation, the light propagating in one of the waveguides is coupled into the second waveguide. The coupler may be a third waveguide that upon in-plane deflection, is brought into close proximity or to contact with the sides of the two waveguides. This action creates an optical path by means of the evanescent fields of the two waveguides and the coupling waveguide itself. This basic building block creates a 1 to 1 switching unit that can be scaled up to form non-blocking matrices of 'n' input waveguides by 'm' output waveguides. Applications for Wavelength Add and Drop Systems, and for Gain Equalizer Systems are described.



