Tortion Mirror Switch

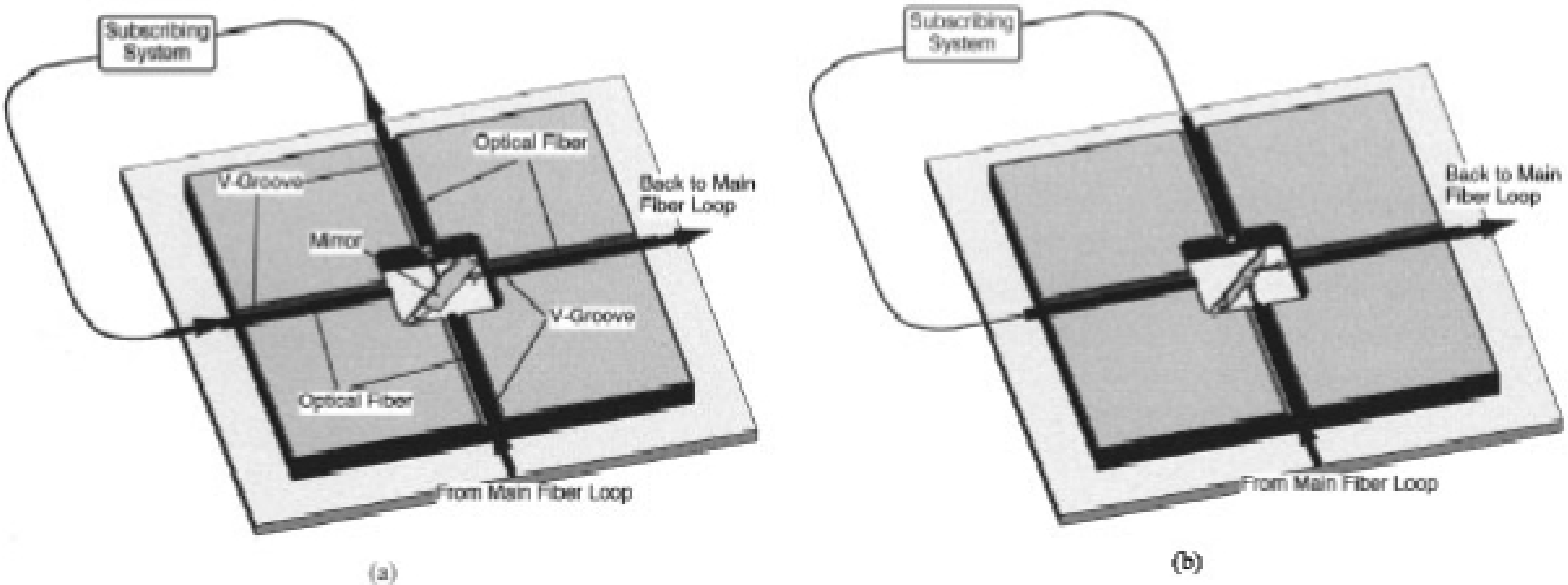

Fig. 1. Schematic view of micromechanical fiber-optic crossconnector of a torsion mirror. (a) Mirror at the rest position. (b) At active position.

H. Toshiyoshi, D. Miyauchi, H. Fujita
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Tortion Mirror Equations

The magnetic torque T_m produced by an applied magnetic field H_d is:

$$T_m = V_m M_s H_d \sin(\pi/2 - \theta)$$

where M_s is the saturation magnetization and V_m is the volume of magnetic material on the mirror.

The mechanical restoring torque of the tortion beam is:

$$T_r = [2(Gwt^3\theta)/3\ell]\{(1 - 192/\pi^5)(t/w)[\tanh(\pi w/2t)]\}$$

where ℓ, w & t are the length, width & thickness of the beam and G is the sheer modulus of silicon.

Setting these two equations equal to each other gives the values of θ as a function of magnetic field

Rotory Electrostatic Micromotor

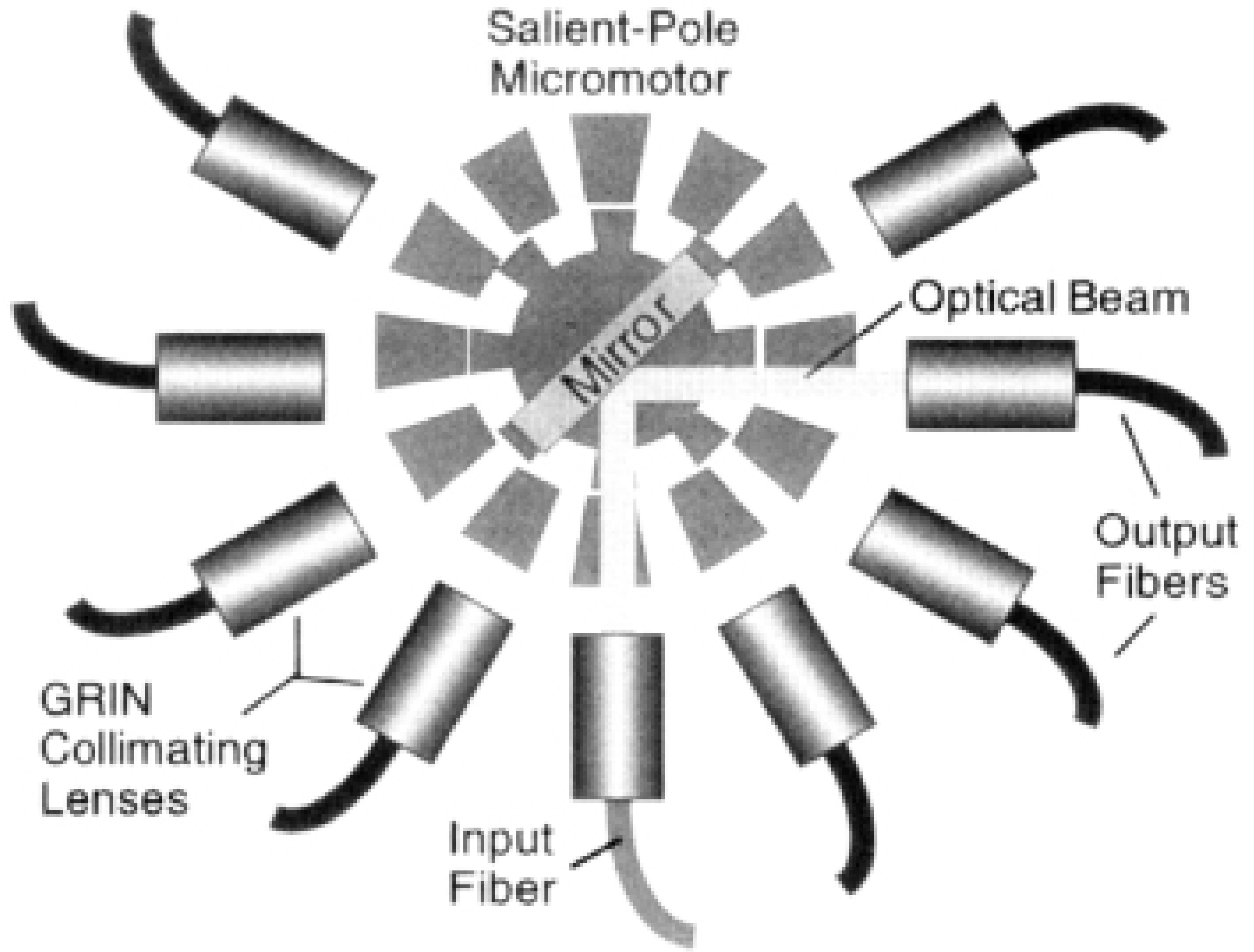

Fig. 1. Rotary-mirror optical test setup showing the eight possible output channels and an example switch position to the 90° output channel.

A. Yasseen, N. Mitchell, J. Klemic, D. Smith, M. Mehregany

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