74913

US005319726A

United States Patent [19]

Abney

[11] Patent Number: 5,319,726

[45] Date of Patent: Jun. 7, 1994

[54] MULTI-LINE PASSIVE FIBER OPTIC SLIPRING

[75] Inventor: Darrell T. Abney, Virginia Beach, Va.

[73] Assignee: The United States of America as represented by the Secretary of the Navy, Washington, D.C.

[21] Appl. No.: 129,725

[22] Filed: Sep. 30, 1993

[51] Int. Cl.[5] G02B 6/26

[52] U.S. Cl. 385/26; 385/25; 385/33

[58] Field of Search 385/26, 25, 33-36; 359/813, 814; 250/227.11, 227.14

[56] References Cited

U.S. PATENT DOCUMENTS

4,900,117 2/1990 Chen 385/26

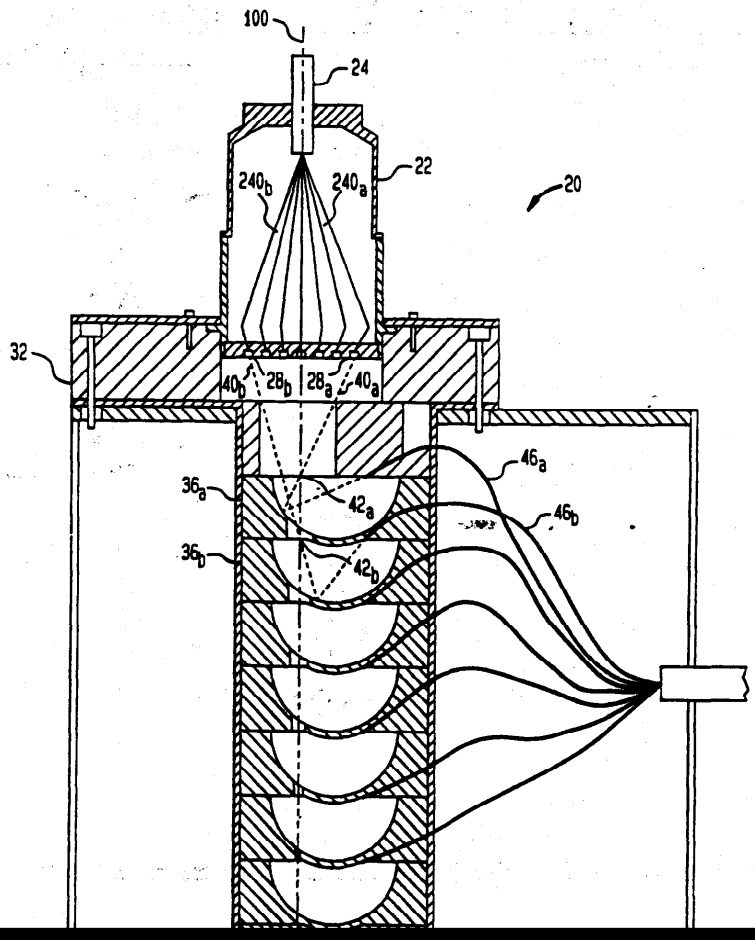
4,943,137 7/1990 Speer 385/26

Primary Examiner—Rodney B. Bovernick

Assistant Examiner—Phan Thi. Heartney

Attorney, Agent, or Firm—Michael J. McGowan; Prithvi C. Lall; Michael F. Oglo

[57] ABSTRACT

A multi-line, passive fiber optic slipring is provided. A plurality of transmitting optical fibers are terminated in a plurality of focusing lenses. The fibers and focusing lens are free to rotate about an axis rotation. A plurality of ellipsoidal mirrors are stacked on top of one another beneath the focusing lenses such that the axis of rotation passes through a first focal point of each of the plurality of ellipsoidal mirrors. Each of the focusing lenses focuses optical signals through the first focal point of a corresponding one of the ellipsoidal mirrors. The optical signals reflect from each corresponding mirror to a second focal point of the corresponding mirror. Each mirror is further provided with an optical aperture along the axis of rotation to allow the optical signals not focused on the first focal point of the corresponding mirror to pass therethrough. Each of a plurality of receiving optical fibers is fixed at a corresponding one of the second focal points.

13 Claims, 4 Drawing Sheets