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- [54] **ATOMIC FORCE MICROSCOPE EMPLOYING BEAM-TRACKING**
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- [21] Appl. No.: **717,767**
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Related U.S. Application Data

- [63] Continuation of Ser. No. 427,353, Feb. 15, 1995, Pat. No. 5,587,523, which is a continuation of Ser. No. 190,948, Feb. 3, 1994, Pat. No. 5,440,920.
- [51] Int. Cl.⁶ **G01B 5/22**
- [52] U.S. Cl. **73/105**
- [58] Field of Search **73/105; 250/306**

(List continued on next page.)

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[57] ABSTRACT

A scanning probe microscope such as an atomic force microscope for measuring a feature of a sample surface with a sharp probe over an area of interest by means of a collimated light beam reflected from a reflective surface responsive to movement of the sharp probe relative to the sample surface, the movement detected by a position sensitive photodetector, includes a scanner having one end fixed and another end free and attached to the sharp probe for moving the sharp probe. Also fixed to the free end of the scanner is a mount for a beam tracking lens which is interposed into the collimated light beam to cause a focus spot of the light beam to track translational movement of the reflective surface caused by the scanner. In this way, a wide range of scanning ranges up to about 100×100 square micrometers is accommodated as is scanner head and scanner mode switching without the need to disturb the sample. Preferably the beam tracking lens is bi-convex and the source of the collimated light beam is a diode laser.

(List continued on next page.)

34 Claims, 3 Drawing Sheets

