sible without departing from the inventive concepts set forth herein. The invention, therefore, is not to be limited except in the spirit of the appended claims.

What is claimed is:

1. A scanning force microscope for examining the surface properties of a sample surface, said microscope comprising:

a frame;

a sample stage adjustable in position with respect to said frame;

a scanner element having a first scanner end fixed in operation with respect to said frame and a second scanner end capable of motion relative to said frame in response to signals applied to said scanner element;

a cantilever having a reflective back surface, a first cantilever end and a second cantilever end, said first cantilever end having a sharp probe tip extending therefrom toward said sample stage, said second cantilever end fixed in operation with respect to said second scanner end;

a beam tracking element mounted to a rigid support element mounted in turn to said scanner element;

a source of a collimated light beam, said source fixed in operation to said frame, said source arranged to project said collimated light beam to said beam tracking element and from said beam tracking element to a focus on said reflective back surface of said cantilever forming a reflected light beam emanating from said reflective back surface; and

a position sensitive detector fixed in operation to said frame and positioned to intercept said reflected light beam and produce a signal responsive to angular movement of said reflected light beam.

2. A scanning force microscope according to claim **1** wherein said position sensitive detector comprises a multi-cell photodetector.

3. A scanning force microscope according to claim **2** wherein said multi-cell photodetector is a bi-cell photodetector.

4. A scanning force microscope according to claim **1** wherein said scanner element is a piezoceramic scanner.

5. A scanning force microscope according to claim **4** wherein said piezoceramic scanner is a tube.

6. A scanning force microscope according to claim **5** wherein said tube is an S-shaped scanner.

7. A scanning force microscope according to claim **1** wherein said beam tracking element is a lens.

8. A scanning force microscope according to claim **7** wherein said lens is bi-convex.

9. A scanning atomic force microscope according to claim **1** wherein said source includes a laser.

10. A scanning force microscope according to claim **9** wherein said laser is a diode laser.

11. A scanning force microscope according to claim **10** wherein said source further includes means for adjusting the position of said source with respect to said frame.

12. A scanning force microscope according to claim **1** wherein said position sensitive detector further includes means for adjusting the position of said position sensitive detector with respect to said frame.

13. An atomic force microscope for examining the surface properties of a sample surface, said atomic force microscope comprising:

a frame;

a sample stage adjustable in position with respect to said frame;

a piezoceramic tube scanner element having a first scanner end fixed in operation with respect to said frame and a second scanner end capable of motion relative to said frame in response to signals applied to said scanner element;

a cantilever having a reflective back surface, a first cantilever end and a second cantilever end, said first cantilever end having a sharp probe tip extending therefrom toward said sample stage, said second cantilever end fixed in operation with respect to said second scanner end;

a beam tracking lens mounted to a rigid support element fixed in operation to said scanner element;

a source of a collimated light beam including a diode laser module, said source fixed in operation to said frame, said source arranged to project said collimated light beam through said beam tracking lens and to a focus on said reflective back surface of said cantilever forming a reflected light beam emanating from said reflective back surface; and

a position sensitive photodetector fixed in operation to said frame and positioned to intercept said reflected light beam and produce a signal responsive to angular movement of said reflected light beam.

14. An atomic force microscope according to claim **13** wherein said position sensitive photodetector further includes means for adjusting the position of said position sensitive detector with respect to said frame.

15. An atomic force microscope according to claim **13** wherein said source further includes means for adjusting the position of said source with respect to said frame.

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