photodiodes produce signals that are conveyed through leads **550** that run through optical fiber assembly **542** to external instrumentation used for processing the light signals. Microsensors **570** that optically track the position of scanning optical fiber **546** provide a signal that enables higher accuracy and speed in delivering the scanned illumination to be achieved by accurately determining the scanning motion (e.g., position, velocity, frequency, etc.) of the scanning optical fiber.

[**0161**] It will be understood that in a conventional rigid endoscope, a ring of optical fibers is typically used for providing a diffuse white light illuminating the ROI. In the retrofit endoscope of **FIG. 12**, the scanning optical fiber can convey all necessary illumination for imaging, diagnosis, and therapy. Unlike the previous embodiments, the scanning optical fiber in the retrofit endoscope is not disposed at the distal tip of the device and therefore does not suffer from the relatively strict dimensional constraints. In this embodiment, the advantages of the present invention include the ability to direct high energy laser illumination with pixel accuracy, to implement fluorescent imaging and other diagnostic evaluations for cancer screening and other diagnostic purposes, and to carry out range finding. In addition, optical therapies and tissue sensing, and dosage monitoring can be implemented with this system. It is also contemplated that the system can be expanded to the proximal end of a flexible imaging system, but there may then be an unacceptable loss of optical resolution. With the device shown in **FIG. 12**, photodiodes **548** can be replaced with optical fibers for spectroscopic analysis or mad confocal for coherence measurements at the proximal end, as part of the optical diagnosis. Alternatively, a tapered or pulled glass optical fiber or a thin film waveguide could be used rather than the scanning optical fiber illustrated, for high resolution optical scanning.

[**0162**] Although the present invention has been described in connection with the preferred form of practicing it and modifications thereto, those of ordinary skill in the art will understand that many other modifications can be made to the present invention within the scope of the claims that follow. Accordingly, it is not intended that the scope of the invention in any way be limited by the above description, but instead be determined entirely by reference to the claims that follow.

The invention in which an exclusive right is claimed is defined by the following:

1. Apparatus for selectively providing imaging and at least one other function for a region of interest in a patient, comprising:

(a) at least one light source that produces light;

(b) a light guide having a proximal end and a distal end, the at least one light source being optically coupled to the proximal end of said light guide, said distal end of the light guide being adapted to be positioned adjacent to a region of interest;

(c) a scanning actuator disposed adjacent to the distal end of the light guide, said scanning actuator causing light produced by the at least one light source that is conveyed through the light guide to scan a region of interest;

(d) a light detector that receives light from a region of interest, producing a signal corresponding to an intensity of said light for use in producing an image of a region of interest;

(e) a display adapted to enable a user to visualize an image of a region of interest; and

(f) a control circuit that is coupled to control the scanning actuator, the at least one light source, and the light guide, said control circuit being adapted to selectively energize the at least one light source to image a region of interest and render at least one other function to a region of interest, said at least one other function including at least one of diagnosing a condition, rendering a therapy, sensing a condition, and monitoring a condition.

2. The apparatus of claim 1, wherein the at least one light source comprises a plurality of light sources that emit light of different colors, further comprising a combiner that combines the light of different colors emitted by the plurality of light sources for input to the proximal end of the light guide.

3. The apparatus of claim 2, wherein the light detector comprises a plurality of light sensors that are each sensitive to one of the different colors of light emitted by the plurality of light sources.

4. The apparatus of claim 1, wherein the light detector comprises a plurality of light sensors that are disposed adjacent to the distal end of the optical fiber.

5. The apparatus of claim 4, further comprising a plurality of light guides that convey the light reflected from a region of interest to the plurality of light sensors.

6. The apparatus of claim 5, wherein different portions of the plurality of light guides are adapted to convey light collected from spaced-apart areas within a region of interest, enabling a pseudo-stereo image of a region of interest to be visualized by a user with the display.

7. The apparatus of claim 1, wherein the light detector comprises a plurality of light sensors that are coupled to the proximal end of the light guides.

8. The apparatus of claim 1, wherein the scanning actuator comprises at least one electromechanical actuator that moves the distal end of the light guide in a two-dimensional scanning mode.

9. The apparatus of claim 1, wherein the scanning actuator comprises a piezoceramic actuator that is energized at a harmonic of a resonant frequency of the distal end of the light guide, causing the light guide to oscillate.

10. The apparatus of claim 1, wherein the light guide comprises an optical fiber, and wherein the distal end of the optical fiber is tapered to a substantially smaller cross-sectional size than a more proximal portion of the optical fiber.

11. The apparatus of claim 1, further comprising at least one lens adapted to be disposed between the distal end of the light guide and a region of interest, said at least one lens being adapted to focus the light produced by the at least one light source onto a region of interest.

12. The apparatus of claim 11, wherein said at least one lens comprises a lens mounted at the distal end of the light guide, said scanning actuator being adapted to drive the distal end of the light guide in a resonance mode to scan a region of interest, said lens that is mounted at the distal end of the light guide having sufficient mass so that the lens