the desired location. Once positioned, automatic vibration compensation is provided, as noted in a block **452** to stabilize the image in regard to biological motion (breathing and cardiovascular movement) and physical movement of the patient. In addition, other mechanisms are provided in at least one embodiment that is disclosed below for stabilizing the optical fiber where desired within a body cavity or passage within a patient's body.

[**0113**] Details of the various functions that can be implemented with the present invention as follows:

[**0114**] Integrated Imaging, Screening, and Diagnosis

[**0115**] Optical tissue imaging using UV, visible, and IR wavelengths;

[**0116**] Fluorescence imaging using UV, visible, and IR wavelengths;

[**0117**] Thermal imaging using IR wavelengths;

[**0118**] Deep tissue imaging using IR wavelengths;

[**0119**] Concentric confocal and true confocal imaging;

[**0120**] Imaging through blood using IR wavelengths;

[**0121**] Polarization-contrast imaging;

[**0122**] Laser feedback microscopy;

[**0123**] Optical coherence tomography (OCT) and reflectometry (OCR);

[**0124**] Optically stimulated vibro-acoustography analysis;

[**0125**] High resolution and magnification tissue-contact imaging;

[**0126**] Laser-induced fluorescence (LIF) and ratio fluorescence imaging and detection;

[**0127**] Multi-photon excitation fluorescence imaging;

[**0128**] Fluorescence lifetime imaging and analysis;

[**0129**] True sizing of imaged structures using stereo and range finding options;

[**0130**] Laser-induced fluorescence spectroscopy (LIFS);

[**0131**] Raman spectroscopy analysis;

[**0132**] Elastic scattering spectroscopy (ESS) analysis;

[**0133**] Absorption spectroscopy;

[**0134**] Detection and mapping of chemi-luminescence and cell viability;

[**0135**] Spatial mapping of optical sensor data (oxygen concentrations, pH, ionic concentrations, etc.);

[**0136**] Temperature measurement and feedback control; and

[**0137**] Other measurements such as color, laser power delivery, tissue properties, photobleaching, and photocreation of compounds for monitoring and feedback control.

[**0138**] Therapies, Surgeries, and Monitoring

[**0139**] Photodynamic Therapy (PDT);

[**0140**] Heating of tissue and/or tumors, (e.g. hyperthermia treatment);

[**0141**] Laser surgery from optical illumination (UV, heat, and/or ablation)

[**0142**] Photoactivated chemistry, photopolymerization, and implantation of biomaterials;

[**0143**] Laser cauterization from hot-tipped scanner (optically or electronically heated); and

[**0144**] Mechanical destruction of tissue using shock waves produced by absorption of pulsed optical radiation.

[**0145**] Interactive Displays & Advanced User Interface Design

[**0146**] Quasi-stereo on display monitors, stereographic mapping using pseudo color overlay, and true 3D display formats (Note: Individual display strategies and capabilities depend on the specific application); and

[**0147**] Interactive touch/point screen.

[**0148**] **FIGS. 9A and 9B** illustrate the different functions that can be carried out with the present invention, depending upon the instrumentation that is used. **FIG. 9A** shows a single scanning waveguide used for imaging, sampling diagnoses, and administering therapy, while in **FIG. 9**B, the single scanning waveguide is used for 3D imaging, obtaining a tumor biopsy, and monitoring endoscopic surgery. While in both these figures, many of the components are identically provided, it is helpful to recognize that by making small modifications to the components that are used as part of the system, different functionality can be provided. In a system **460** shown in **FIG. 9**A, an interactive computer workstation **462** enables medical practitioners to control the scanning optical fiber and to execute software algorithms used for imaging, diagnosis (e.g., optical biopsy), and administering therapy. A high resolution color monitor **464** receives signals from a scanning optical fiber **484** that are conveyed over an optical fiber system **488** to a distribution console **472**. Optional RGB detectors may be provided if not included internally within the patient's body adjacent to scanning optical fiber **484**. An ROI **486** is scanned by the optical fiber to produce the high resolution color images displayed to a user. In a passive display embodiment, two cathode ray tube monitors (CRTs) display images using two different contrast modes to generate the images of the same object (e.g., tissue). For example, the same resonant driven scanning optical fiber may produce both a full-color optical image on one CRT and a grayscale fluorescence image on the other CRT monitor. If the optical properties of the excitation and signal do not overlap, then two or more images may be generated simultaneously. Otherwise, the two images are either captured in a frame sequential method or in alternating line sweeps of the fast resonant scanner. To switch between image contrast modes (full-color optical and fluorescence), the light sources are shuttered or directly turned off-on. Synchronized in time during the modulation of both illumination power and spectral range, the signals from the photon detectors are recorded and displayed as separate images. In this example, having a second fluores-