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An Endoscopic Long Range Fourier Domain Optical Coherence Tomography (Lr-Fd-Oct)

Tech ID: 21652 / UC Case 2010-034-0

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	8,285,368	10/09/2012	2010-034

FULL DESCRIPTION

There are approximately 20-40 million people in the United States with sleep apnea. Obstructive sleep apnea has been recognized as a very common disorder and an important cause of morbidity and mortality. Obstructive sleep apnea is characterized by repetitive interruptions of breathing during sleep due to the collapse of the upper airway.

Sleep apnea can lead to severe health complications including hypertension, heart failure, memory impairment, motor vehicle and work accidents, decreased work productivity, and increased risk of death. The development of a novel, simple, rapid, minimally invasive method for the diagnosis and optimization of treatment of patients with obstructive sleep apnea would be a tremendous advance for these millions of patients.

Optical coherence tomography (OCT) is an imaging modality that can perform cross section views of tissue. OCT is analogous to ultrasound except that imaging is performed with light instead of acoustic waves. OCT is non invasive and non ionizing allowing study over lengthy periods during both sleep and wakefulness. Conventional OCT which is based on time domain technique has very limited imaging speed which precludes its use in real-time, dynamic monitoring and large volume detection.

Researchers at the University of California have developed a technique including the step of combining a narrow line-width sweptsource based Fourier domain OCT (FDOCT) system with an endoscopic probe to enable an ideal upper airway imaging technology which is low-cost, compact, noninvasive, non-ionizing, dynamic (to visualize apneic events), suitable for supine position study, and capable of high resolution three dimensional images.

This technology provides a mechanism for dynamic evaluation of obstructive sleep apnea.

SUGGESTED USES

An endoscopic long range Fourier domain optical coherence tomography (LR-FD-OCT) system permits the rapid three-dimensional anatomical imaging of airways and provide a mechanism for determining the sites and extent of airway collapse during obstructive sleep apnea.

ADVANTAGES

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OTHER INFORMATION

CATEGORIZED AS

- » **Imaging**
 - » 3D/Immersive
 - » Medical
 - » Other
- » **Medical**
 - » Devices
 - » Diagnostics
 - » Disease: Respiratory and Pulmonary System
 - » Imaging
 - » Research Tools
- » **Research Tools**
 - » Other

RELATED CASES

The illustrated embodiment of the invention uses a Fourier domain technique based on a narrow bandwidth high speed wavelength swept source and provides much higher imaging speed compared to the previous time domain method. The new technique is capable of long-range, ultrafast, high sensitivity, three-dimensional, quantitative and continuous imaging of the upper airway anatomy.

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