INTEGRATED SLEEP DIAGNOSIS AND TREATMENT DEVICE AND METHOD

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BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION

The present invention relates to an integrated sleep diagnosis and treatment device, and more particularly to an integrated apnea diagnosis and treatment device. The present invention additionally relates to method of sleep diagnosis and treatment.

2. TECHNICAL BACKGROUND

Nearly one in seven people in the United States suffer from some type of chronic sleep disorder, and only fifty percent (50%) of people are estimated to get the recommended seven (7) to eight (8) hours of sleep each night. It is further estimated that sleep deprivation and its associated medical and social costs (loss of productivity, industrial accidents, etc) exceed $150 billion dollars per year. Excessive sleepiness can deteriorate the quality of life and is a major cause of morbidity and mortality due to its role in industrial and transportation accidents. Sleepiness further has undesirable effects on motor vehicle driving, employment, higher earning and job promotion opportunities, education, recreation, and personal life.

Sleeping disorders such as for example narcolepsy and sleep apnea are currently diagnosed by two general methods. The first is via subjective methods

such as the Epworth and Standford Sleepiness Scale, which generally involves questionnaires where the patients answer a series of qualitative questions regarding their sleepiness during the day. With these methods, however, it is found that the patients usually underestimate their level of sleepiness or they deliberately falsify their responses because of their concern regarding punitive action, or as an effort to obtain restricted stimulant medication.

The second is via physiological based evaluations such as all night polysomnography to evaluate the patients sleep architecture (e.g., obtaining respiratory disturbance index to diagnose sleep apnea) followed by an all day test such as the Multiple Sleep Latency Test (MSLT) or its modified version, Maintenance of Wakefulness Test (MWT). While the MSLT and MWT are more objective and therefore don't have the same limitations as mentioned for the subjective tests, the MSLT and MWT have their own limitations. Both the MSLT and MWT require an all-day stay at a specialized sleep clinic and involve monitoring a number of nap opportunities at two hour intervals throughout the day. Further, the MSLT mean sleep latency is only meaningful if it is extremely short in duration (e.g., to diagnose narcolepsy), and only if the overnight polysomnogram does not show any sleep disordered breathing. Another problem with the MSLT mean sleep latency is the so-called "floor effect" where the sleep latency in the pathologically sleepy patients can be almost zero (0) minutes, i.e., the patient falls asleep almost immediately following turning off the light in the MSLT test. This type of result has a tendency to limit the diagnostic resolution of the test. Finally, studies have shown that the MSLT is not particularly suited for gauging the effects of therapeutic intervention. This was demonstrated in studies by Thorpy in 1992 and Van den Hoed et al. in 1981 showing no reliable reduction in sleepiness in patients given stimulant medications for narcolepsy.

With sleeping disorders such as sleep apnea medications or some physical form of therapy can be used to treat the disorder. The treatment is determined based on one of the above tests, and can be adjusted by re-testing of the patient at

some later time to determine whether the condition or the symptoms have been alleviated.

For example, the most common method of treating the sleeping disorder of sleep apnea is by apply a continuous positive gas pressure to the patient's airway, which has the effect of forcing the patient to breath through application of the pressure. More advanced, but still very basic devices have been developed that adjust this continuous positive gas pressure through sensors built into the device for creating the positive gas pressure, which measure gas flow through the device. These basic adjustable devices have been found to be expensive and largely ineffective.

None of the devices on the market can be used to adjust a patient's treatment, whether physical or chemical, based on the patient's current physiological state. Further none of the current devices can be used to adjust a patient's treatment, based on the patient's current symptoms. Still further, none of the current devices can be used to predict the onset of symptoms of various sleeping disorders and provide treatment in anticipation of such symptoms. Still even further, none of the current devices can be used to adjust a treatment device based on the subject's physiological signals.

It is therefore an object of the present invention to provide a system and method of treatment, which analyzes a subject's sleeping disorder or symptoms and adjusts a treatment device based, in part, on this analysis. It is still another object of the present invention to have a closed loop system or partly closed loop system or method, which automatically adjusts a treatment device based on analysis of a subject's sleeping disorder or symptoms. It is still another object of the present invention to provide a system or method for treating a subject's sleeping disorder or symptoms that is predictive. It is still further another object of the present invention to provide a system or method of treating a subject's sleeping disorder or symptoms that uses a subject's physiological signals, e.g., EEG, EKG, EMG, etc.

SUMMARY OF THE INVENTION

The present invention relates to an integrated sleep diagnosis and treatment device, and more particularly to an integrated apnea diagnosis and treatment device. The present invention additionally relates to method of sleep diagnosis and treatment.

There are numerous embodiments of the present invention with a few of those listed below. The present invention further relates to a sleep diagnosis device integrated with a treatment device. The sleep disorder treatment system of the present invention can use a diagnosis device to perform various forms of analysis to determine or diagnose a subject's sleeping disorder or symptoms of a subject's sleep disorder, and using this analysis or diagnosis can with or in some embodiments without human intervention treat the subject either physically or chemically to improve the sleeping disorder or the symptoms of the sleeping disorder. The diagnostic part of the system can use many different types of sensors and methods for diagnosing the severity of the symptoms of or the sleep disorder itself. The treatment part of the system can use a device to physically or chemical treat the subject's symptoms or sleep disorder itself.

The diagnostic part of the system or device can use various sensors for measuring the subject's brain wave signals, respirations and the like. Sensors for measuring the subject's brain wave signals include EEG electrodes and the like. Sensors for measuring the subject's respirations or oxygen levels include sensors to measure airflow, respiratory effort, oxygenation and ventilation, and the like. Measurement of airflow is preferably measured using sensors or devices such as a pneumotachometer, strain gauges, thermal sensors, transducers, piezo sensors, magnetometers, pressure sensors, static charge-sensitive beds, and the like. These sensors or devices, also preferably measure nasal pressure, respiratory inductance plethysmography, thoracic impedance, expired carbon dioxide, tracheal sound and

the like. Measurement of respiratory effort is preferably measured by esophageal pressure, surface diaphragmatic EMG, and the like. Measurement of oxygenation and ventilation is preferably measured by pulse oximetry, transcutaneous oxygen monitoring, transcutaneous carbon dioxide monitoring, expired end carbon dioxide monitoring, and the like.

Signals from these sensors are then analyzed to determine the level of severity of the symptoms of the subject's sleep disorder and in some cases to diagnose the sleep disorder itself. One particular embodiment of the present invention involves diagnosing the level of severity of a subject's sleep apnea and with or without human intervention adjusting an apparatus for providing positive airway pressure to the subject. The treatment device can be adjusted by either by a closed loop control system which uses, in part, the data or signals from the diagnosis device to actuate a physical or chemical treatment system for the subject, or an open loop control system which can alert a human who then adjusts the treatment device based in part on the data or signals from the diagnosis device. Alternatively, signals from the sensors can be saved on a medium in order to be retrieved and analyzed at a later date. Media on which data can be saved include, but are not limited to chart recorders, hard drive, floppy disks, computer networks, optical storage, solid-state memory, magnetic tape, punch cards, etc.

The treatment device can be any device known to those skilled in the art. The treatment device can either physically or chemically treat the subject's sleeping disorder. An example of physically treating the subject's sleeping disorder would be a device to provide positive airway pressure to a subject. An example of chemically treating the subject's sleeping disorder would be to have a medication reservoir where a drug is delivered to the subject in order to treat symptoms of the sleeping disorder. A few of the many embodiments of the present invention are as follows.

In one embodiment, the present invention includes a sleeping disorder

treatment system comprising a device for diagnosing and creating an output of a level of severity of a subject's sleeping disorder; and a device for physically or chemically treating a subject's sleeping disorder, which can be adjusted using the output of the level of severity of the subject's sleeping disorder.

In another embodiment, the present invention includes a sleep apnea treatment system comprising a device for diagnosing and creating an output of a level of severity of a subject's sleep apnea; and a continuous positive airway pressure (CPAP) device for treating the subject's sleep apnea, whose airflow rate can be automatically adjusted using the output.

In still another embodiment, the present invention includes a sleep apnea treatment system comprising a device for diagnosing sleep apnea comprising EEG sensors, and creating an output of a level of severity of a subject's sleep apnea; and a CPAP device for treating the subject's sleep apnea, which can be automatically adjusted using the output.

In still another embodiment, the present invention includes a sleeping disorder treatment system comprising a device for diagnosing and creating a output of a level of severity of a subject's sleeping disorder or symptoms, comprising at least two EEG electrodes for measuring the subject's electro-physiological signals; and a device for physically or chemically treating a subject's sleeping disorder or symptoms, which can be adjusted using in part the output of the level of severity of the subject's sleeping disorder.

In still another embodiment, the present invention includes a sleeping disorder treatment system comprising a device for diagnosing and creating a output of a level of severity of a subject's sleeping disorder or symptoms comprising at least two ECG electrodes for measuring the subject's brain waves; and a device for physically or chemically treating a subject's sleeping disorder or symptoms, which can be adjusted using in part the output of the level of severity of the subject's sleeping disorder.

In still another embodiment, the present invention includes a sleeping disorder treatment system comprising a device for diagnosing and creating a output of a level of severity of a subject's sleeping disorder or symptoms comprising a sensor for measuring the subject's blood gases; and a device for physically or chemically treating a subject's sleeping disorder or symptoms, which can be adjusted using in part the output of the level of severity of the subject's sleeping disorder.

Finally, in still another embodiment, the present invention includes a sleeping disorder treatment system comprising a device for diagnosing and creating a quantitative output of a level of severity of a subject's sleeping disorder or symptoms comprising a pulse oximeter sensor; and a device for physically or chemically treating a subject's sleeping disorder or symptoms, which can be adjusted using in part the output of the level of severity of the subject's sleeping disorder.

Additional features and advantages of the invention will be set forth in the detailed description which follows, and in part will be readily apparent to those skilled in the art from that description or recognized by practicing the invention as described herein, including the detailed description which follows, the claims, as well as the appended drawings.

It is to be understood that both the foregoing general description and the following detailed description are merely exemplary of the invention, and are intended to provide an overview or framework for understanding the nature and character of the invention as it is claimed. The accompanying drawings are included to provide a further understanding of the invention, and are incorporated in and constitute a part of this specification. The drawings illustrate various embodiments of the invention, and together with the description serve to explain the principles and operation of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block diagram an embodiment of part of the diagnostic device of sleeping disorder treatment system of the present invention.

FIG. 2 is a block diagram of an embodiment of the signal processing module of the sleeping disorder treatment system of the present invention.

FIG. 3 is a block diagram of an embodiment of a base station of part of the diagnostic device of the sleeping disorder treatment system of the present invention.

FIG. 4 is a block diagram of an embodiment of a base station of part of the diagnostic device of the sleeping disorder treatment system of the present invention.

FIG. 5 is a block diagram of an embodiment of the programming firmware in the signal processing module of part of the diagnostic device of the sleeping disorder treatment system of the present invention.

FIG. 6 is a block diagram of an embodiment of the programming of the interrupt service routine in the firmware in the signal processing module of part of the diagnostic device of the sleeping disorder treatment system of the present invention.

FIG.7 is a schematic view of a pressure support system.

FIG. 8 is a schematic view of one embodiment of the sleep disorder

treatment system of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention relates to an integrated sleep diagnosis and treatment device, and more particularly to an integrated apnea diagnosis and treatment device. The present invention additionally relates to various methods of an integrating sleep diagnosis and treatment.

The sleep disorder treatment system of the present invention encompasses numerous embodiments. Various embodiments of the present invention include a device for diagnosing and creating an output of a level of severity of the subject's sleeping disorder and/or symptoms. The present invention includes devices and sensors for diagnosing a subject's sleeping disorder and/or symptoms including utilizing a subject's electro-physiological signals such as EEG, EKG, EMG, EOG and the like, a subject's blood gases such as CO^2 and O^2, and a subject's respiratory patterns using an accelerometer, chest-motion detector and the like.

Sleep apnea is defined as the cessation of breathing during sleep. There are three different types of sleep apnea: obstructive sleep apnea (OSA), central sleep apnea (CSA), and mixed sleep apnea (MSA). Of these three, OSA is the most common; CSA is rare; mixed sleep apnea is a combination of the previous two with treatment being the same as OSA. Treatment of OSA and CSA vary substantially which makes a proper diagnosis of the correct type of sleep apnea (OSA or CSA) critical for an effective treatment.

Obstructive sleep apnea is characterized by repetitive pauses in breathing during sleep due to the obstruction and/or collapse of the upper airway (throat), usually accompanied by a reduction in blood oxygen saturation, and followed by an awakening to breathe. This is called an apnea event. Respiratory effort continues during the episodes of apnoea. Multiple episodes of Apnoea may occur

in one night, causing sleep disruption.

Central Sleep Apnea is defined as a neurological condition causing cessation of all respiratory effort during sleep, usually with corresponding decreases in blood oxygen saturation. The brainstem center controlling breathing shuts down there's no respiratory effort and no breathing. This is in contrast with OSA where there is respiratory effort from the brain stem but a physical blockage prevents inhalation of oxygen. The subject is aroused from sleep by an automatic breathing reflex, so the subject may end up getting very little sleep at all. CSA, which is a neurogical disorder, is very different in cause than OSA, which is a physical blockage - though the effects are highly similar.

Mixed sleep apnoea, as the name suggests, is a combination of the OSA and CSA. An episode of mixed sleep apnoea usually starts with a central component and then becomes obstructive in nature. Generally the central component of the apnoea becomes less troublesome once the obstructive apnoea is treated.

Sensors which can be used are known to those skilled in the art. These sensors include electrodes for measuring electro-physiological signals such as EEG, ECG, EMG, EOG and the like. These electro-physiological signals can be obtained by any method known in the art, or subsequently developed by those skilled in the art to detect these types of signals. Sensors include but are not limited to electrodes or magnetic sensors. Since electro-physiological signals are, in general, electrical currents which produce associated magnetic fields, the present invention further anticipates methods of sensing those magnetic fields to acquire brain wave signals similar to those which can be obtained through, for example, an electrode applied to the subject's scalp. The subject(s) referred to in the present invention can be any form of animal. Preferably the subject(s) are mammal, and most preferably human.

If electrodes are used to pick up the electro-physiological signals, these

electrodes for example when measuring brain wave or EEG signals may be placed at one or several locations on the subject(s)' scalp or body. The electrode(s) can be placed at various locations on the subject(s) scalp in order to detect EEG or brain wave signals. Common locations for the electrodes include frontal (F), parietal (P), anterior (A), central (C) and occipital (O). Preferably for the present invention at least one electrode is placed in the occipital position. In order to obtain a good EEG or brain wave signal it is desirable to have low impedances for the electrodes. Typical EEG electrodes connections may have an impedance in the range of from 5 to 10 K ohms. It is in generally desirable to reduce such impedance levels to below 2 K ohms. Therefore a conductive paste or gel may be applied to the electrode to create a connection with an impedance below 2 K ohms. Alternatively or in conjunction with the conductive gel, the subject(s)' skin may be mechanically abraded, the electrode may be amplified or a dry electrode may be used. Dry physiological recording electrodes of the type described in U.S. Patent Application 09/949,055 are herein incorporated by reference. Dry electrodes provide the advantage that there is no gel to dry out, no skin to abrade or clean, and that the electrode can be applied in hairy areas such as the scalp. Additionally if electrodes are used as the sensor(s), preferably at least two electrodes are used – one signal electrode and one reference electrode; and if further EEG or brain wave signal channels are desired, the number of electrodes required will depend on whether separate reference electrodes or a single reference electrode is used. For the various embodiments of the present invention, preferably an electrode is used and the placement of at least one of the electrodes is at or near the occipital lobe of the subject's scalp.

If electrodes are used to pick up the electro-physiological signals, these electrodes for example when measuring cardiac signals using an ECG, may be placed at specific points on the subject's body. The ECG is used to measure the rate and regularity of heartbeats as well as the size and position of the chambers,

any damage to the heart and in diagnosing sleeping disorders. As the heart undergoes depolarization and repolarization, electrical currents spread throughout the body because the body acts as a volume conductor. The electrical currents generated by the heart are commonly measured by an array of preferably 12 electrodes, placed on the body surface. Although a full ECG test usually involves twelve electrodes, for the purposes of a sleep study only two are required. These are placed on the subject's left-hand ribcage, under the armpit and on the right-hand shoulder, near the clavicle bone. An ECG is important as a tool to detect the cardiac abnormalities that can be associated with respiratory-related sleeping disorders. Preferably electrodes are placed on each arm and leg, and six electrodes are placed at defined locations on the chest. The specific location of each electrode on a subject's body is well known to those skilled in the art and varies amongst individual and different types of subjects. These electrode leads are connected to a device contained in the signal processing module of the present invention that measures potential differences between selected electrodes to produce electrocardiographic tracings.

There are two basic types of ECG leads: bipolar and unipolar. Bipolar leads (standard limb leads) utilize a single positive and a single negative electrode between which electrical potentials are measured. Unipolar leads (augmented leads and chest leads) have a single positive recording electrode and utilize a combination of the other electrodes to serve as a composite negative electrode.

Other sensors can be used to measure various parameters of a subject's respirations. The subject's respirations can be measured by measurement of airflow, respiratory effort, oxygenation and ventilation, and the like. Measurement of airflow is preferably measuring using sensors or devices such as a pneumotachometer, strain gauges, thermal sensors, transducers, piezo sensors, magnetometers, pressure sensors, static charge-sensitive beds, and the like. These sensors or devices, also preferably measure nasal pressure, respiratory inductance

plethysmography, thoracic impedance, expired carbon dioxide, tracheal sound and the like. Measurement of respiratory effort is preferably measured by esophageal pressure, surface diaphragmatic EMG, and the like. Measurement of oxygenation and ventilation is preferably measured by pulse oximetry, transcutaneous oxygen monitoring, transcutaneous carbon dioxide monitoring, expired end carbon dioxide monitoring, and the like.

One example of such a sensor for measuring respirations either directly or indirectly is a respiration belt. Respiration belts can be used to measure a subject's abdominal and/or thoracic expansion over a measurement time period. The respiration belts may contain a strain gauge, a pressure transducer or other sensors, which can indirectly measure a subject's respirations and the variability of respirations by providing a signal which correlates to the thoracic/abdominal expansion/contractions of the subject's abdominal cavity. Respiration belts may be placed at one or several locations on the subject's torso or in any other manner known to those skilled in the art. Preferably, the respiration belts are positioned below the axilla and/or at the level of the umbilicus in order to measure rib cage and abdominal excursions. More preferably, if respiration belts are used then at least two belts are used one being positioned at the axilla and the other at the umbilicus.

Another example of such a sensor or method for measuring respirations either directly or indirectly is a nasal cannula or a facemask. The nasal cannula or facemask can be used to measure the subject's respiratory airflow. Nasal or oral airflow can be measured quantitatively and directly with a pneumotachograph consisting of a standard oxygen nasal cannula or facemask respectively connected to a pressure transducer and placed in the nares or over the subject's mouth and nose respectively. Airflow can be estimated by measuring nasal or oral airway pressure that decreases during inspiration and increases during expiration. Inspiration and expiration produce fluctuations on the pressure transducer's signal

that is proportional to airflow. A modified nasal cannula or facemask may also be used which is connected to a carbon dioxide or oxygen sensor to measure respective concentrations of these gases. In addition a variety of other sensors can be connected with either a nasal cannula or facemask to either directly or indirectly measure a subject's respirations.

Still another example of such a sensor or method of either directly or indirectly measuring respirations of the subject is the use of a pulse oximeter. The pulse oximeter can measure the oxygenation of the subject's blood by producing a source of light originating from the oximeter at two wavelengths (650nm and 805nm). The light is partly absorbed by haemoglobin, by amounts which differ depending on whether it is saturated or desaturated with oxygen. By calculating the absorption at the two wavelengths the proportion of haemoglobin which is oxygenated can be estimated. Preferably, pulse oximeters are placed on a subject's earlob or fingertip. More preferably, the pulse oximeter is placed on the subject's index finger.

Preferably, the signals from one or more of the aforementioned sensors are fed into some form of device with a processor or relayed to a processor for analyzing the one or more signals from these sensors through either a wireless system, a tethered system or some combination thereof.

One preferable embodiment of this device is a programmable wireless data acquisition system as shown in FIGS. 1-6 and described in more detail herein. This programmable wireless data acquisition system is used to receive the signals from one of more sensors and work with an internal or external processor to analyze the signals. Physiological data is transmitted between the physiological sensors of types described above and the signal processing module using either wired but preferably wireless technology. Once processed, the physiological signals are transmitted wirelessly to the base station. Wireless signals are both received and transmitted via use of a preferably external antenna. Frequencies

used for transmission is primarily 902–928 MHz, but frequencies of 2.4–2.484 GHZ, or Wireless Medical Telemetry Bands (WMTS), 608–614 MHz, 1395–1400 MHz, or 1429–1432 MHz can also be used. In addition, IR or Bluetooth wireless technology can be used for data transmission. The communication between the signal processing unit and base station can also, or in addition, be hardwired, instead of wireless. The physiological sensors are generally hard wired to the signal processing unit, but due to the ongoing evolution in wireless sensor technology, signals from physiological sensors will likely be transmitted wirelessly to the signal processing unit, or alternatively, directly to the base station having an integrated signal processing unit.

Referring now to the drawings and, in particular to FIG. 1, there is shown a block diagram of the present invention. An external input 12 from sensor 14 is input to signal processing module 16. Although, one sensor 14 and one external input 12 are shown, the signal processing module 16 is capable of accepting multiple external inputs 12 from multiple sensors 14. The signal processing module 16 generates a signal 18 encoded with data corresponding to the external input 12. The signal processing module 16 transmits the signal 18 by wireless means to a base station 40. In FIG. 1, the wireless means is shown as radio frequency (RF). In this case, the signal processing module generates a radio frequency signal 18 by frequency modulating a frequency carrier and transmits the radio frequency signal through module antenna 20. The base station 40 receives the radio frequency signal 18 through base antenna 42, demodulates the radio frequency signal 18, and decodes the data. It is understood that other wireless means can be utilized with the present invention, such as infrared and optical, for example. Although one module antenna 20 and one base antenna 42 is shown in this embodiment, it is understood that two or more diversity antennas

can be used and are included in the present invention. An external programming means 60, shown in FIG. 1 as a personal computer, contains software which is used to program the signal processing module 16 and the base station 40 through data interface cable 62. The data interface cable 62 is connected to the base station 40 and signal processing module 16 by respective connectors 64. The same data interface cable 62 or two different interface cables 62 can be used, one for the base station 40 and one for the signal processing module 16. The signal processing module 16 and the base station 40 can be programmed by connecting a data interface cable 62 between it and an external programming means 60 or by radio frequency (or other type) of signals transmitted between a base station 40 to the signal processing module 16 or to another base station 40. RF signals, therefore, can be both transmitted and received by both signal processing module 16 and base station 40. In this event the signal processing module 16 also includes a module receiver 29 while the base station 40 also includes a base transmitter 84, in effect making both the signal processing module 16 and the base station 40 into transceivers. In addition, the data interface cable 62 also can be used to convey data from the base station 40 to the external programming means 60. If a personal computer is the external programming means 60, it can monitor, analyze and display the data in addition to its programming functions. The base receiver 80 and module receiver 29 can be any appropriate receivers, such as direct or single conversion types. The base receiver 80 preferably is a double conversion superheterodyne receiver while the module receiver 29 preferably is a single conversion receiver. Advantageously, the receiver employed will have automatic frequency control to facilitate accurate and consistent tuning of the radio frequency signal 18 received thereby.

Referring now to FIG. 2, there is shown a block diagram of the signal processing module 16 with the sensor 14 and the module antenna 20. The signal processing module 16 comprises input means 22, analog-to-digital (A/D) means

24, a module microcontroller 26 with a nonvolatile memory, advantageously, an EEPROM 261, a module transmitter 28, a module receiver 29 and a module power supply 30. Although the module antenna 20 is shown externally located from the signal processing module 16, it can also be incorporated therein. The module antenna 20 may be a printed spiral antenna printed on a circuit board or on the case of the signal processing module 16 or other type of antenna. A module power supply 30 provides electrical power to the signal processing module 16 which includes the input means 22, A/D means 24, module microcontroller 26 module transmitter 28 and module receiver 29.

The input means 22 is adjustable either under control of the module microcontroller 26 or by means of individually populatable components based upon the specific external input 12 characteristics and range enabling the input means 22 to accept that specific external input 12. For example, if the input is a 4-20 mA analog signal, the input means 22 is programmed by the module microcontroller 26 and/or populated with the components needed to accept that range and characteristic of signals. If the input characteristics change the programming and/or components change accordingly but the same platform circuit board design is utilized. In other words, the same platform design is utilized notwithstanding the character, range, or quantity (number of external inputs 12) [up to a predetermined limit] of the input. For example, bioelectric signals such as EEG, EMG, EKG, and EOG have typical amplitudes of a few microvolts up to a few tens of millivolts. For a given application, a specific frequency band of interest might be from 0.1 Hz to 100 Hz, whereas another application may require measurement of signals from 20 Hz to 10 KHz. Alternatively, measurement of vital signs such as body temperature and respiration rate may deal with signals in a range of +5 volts, with a frequency content from DC (0 Hz) to 20 Hz. For other applications such as industrial process monitoring, the information of interest may be contained in the signal as a

current, such as a 4 to 20 mA current loop sensor, or it may take the form of resistance, impedance, capacitance, inductance, conductivity, or some other parameter, The present invention provides a single device for measuring such widely disparate signal types and presents distinct economic advantages, especially to small enterprises such as a medical clinic located in a rural area, which would be empowered by this invention to conduct tests which would otherwise have required patient travel to a large medical center, with all the attendant cost thereof.

This is possible due to the selectively adaptable input means 22 and A/D means 24, the frequency agile module transmitter 28 and base transmitter 84, and the programmability of the module microcontroller 26 and EEPROM 261. One universal platform design then can be utilized for all applications. In addition, the signal processing module can comprise multiple copies of the input means 22 and the A/D means 24. Cost savings can be achieved by multiplexing at several different points in the input means 22 and the A/D means 24 allowing hardware to be shared among external inputs 12.

After receipt by the input means 22, the external input 12 is inputted to the A/D means 24. The A/D means 24 converts the input to a digital signal 32 and conditions it. The A/D means 24 utilizes at least one programmable A/D converter. This programmable A/D converter may be an AD7714 as manufactured by Analog Devices or similar. Depending upon the application, the input means 22 may also include at least one low noise differential preamp. This preamp may be an INA126 as manufactured by Burr-Brown or similar. The module microcontroller 26 can be programmed to control the input means 22 and the A/D means 24 to provide specific number of external inputs 12, sampling rate, filtering and gain. These parameters are initially configured by programming the module microcontroller 26 to control the input means 22 and the A/D means 24 via input communications line 35 and A/D communications line 36 based upon

the input characteristics and the particular application. If the application changes, the A/D converter is reconfigured by reprogramming the module microcontroller 26. In this manner, the input means 22 and the A/D means 24 can be configured to accept analog inputs of 4-20 mA, +/-5 volts, +/-15 volts or a range from +/- microvolts to millivolts. They also can be configured to accept digital inputs, for detection of contact closure, for example.

The module microcontroller 26 controls the operation of the signal processing module 16. In the present invention, the module microcontroller 26 includes a a serial EEPROM 261 but any nonvolatile memory (or volatile memory if the signal processing module remains powered) can be used. The EEPROM 261 can also be a separate component external to the module microcontroller 26. Advantageously, the module microcontroller 26 may be PIC16C74A PIC16C74B or a PIC16C77 both manufactured by MicroChip, or an Amtel AT90S8515 or similar. The module microcontroller 26 is programmed by the external programming means 60 through the connector 64 or through radio frequency signal from the base station 40. The same module microcontroller 26, therefore, can be utilized for all applications and inputs by programming it for those applications and inputs. If the application or inputs change, the module microcontroller 26 is modified by merely reprogramming. The digital signal 32 is inputted to the module microcontroller 26. The module microcontroller 26 formats the digital signal 32 into a digital data stream 34 encoded with the data from the digital signal 32. The digital data stream 34 is composed of data bytes corresponding to the encoded data and additional data bytes to provide error correction and housekeeping functions. Advantageously, the digital data stream 34 is organized in data packets with the appropriate error correction data bytes coordinated on a per data packet basis. These packets can incorporate data from a single input channel or from several input channels in a single packet, or for some applications may advantageously include several temporally differing

measurements of one or a plurality of input channels in a single packet. The digital data stream 34 is used to modulate the carrier frequency generated by the transmitter 28.

The module transmitter 28 is under module microcontroller 26 control. The module transmitter 28 employs frequency synthesis to generate the carrier frequency. In the preferred embodiment, this frequency synthesis is accomplished by a voltage controlled crystal reference oscillator and a voltage controlled oscillator in a phase lock loop circuit. The digital data stream 34 is used to frequency modulate the carrier frequency resulting in the radio frequency signal 18 which is then transmitted through the module antenna 20. The generation of the carrier frequency is controlled by the module microcontroller 26 through programming in the EEPROM 261, making the module transmitter 28 frequency agile over a broad frequency spectrum. In the United States and Canada a preferred operating band for the carrier frequency is 902 to 928 MHz. The EEPROM 261 can be programmed such that the module microcontroller 26 can instruct the module transmitter 28 to generate a carrier frequency in increments between 902 to 928 MHz. as small as about 5 to 10 KHz. In the US and other countries of the world, the carrier frequency may be in the 2400 to 2483.5 MHz. band, 5.725 to 5.875 GHz. band, or the 24.0 to 24.25 GHz. band, or other authorized band. This allows the system to be usable in non-North American applications and provides additional flexibility.

The voltage controlled crystal oscillator (not shown) in the module transmitter 28, not only provides the reference frequency for the module transmitter 28 but, advantageously also, provides the clock function 38 for the module microcontroller 26 and the A/D means 24 assuring that all components of the signal processing module 16 are synchronized. An alternate design can use a plurality of reference frequency sources where this arrangement can provide certain advantages such as size or power consumption in the implementation.

The module receiver 29 in the signal processing module 16 receives RF signals from the base station 40. The signals from the base station 40 can be used to operate and control the signal processing module 16 by programming and reprogramming the module microprocessor 26 and EEPROM 261 therein.

The base station 40 has a base antenna 42 through which RF signals 18 are received. Base microcontroller 86 controls the operation of the base station 40 including base receiver 80, base transmitter 82, and base power supply 88. Base receiver 80 receives the RF signal 18 from base antenna 42. The base receiver 80 demodulates the RF signal 18 and the base microcontroller 86 removes any error correction and performs other housekeeping tasks. The data is then downloaded through connector 64 to the external programming means 60 or other personal computer (PC) or data storage/viewing device for viewing in real time, storage, or analysis.

Referring now to FIG. 4, there is shown a block diagram of the input means 22 and A/D means 24 of the signal processing module 16, which provides for the data acquisition function of the present invention. The signal processing module 16 is variably configurable through software programming initiated by the external programming means 60 to the EEPROM 261 of the microcontroller 26. The variable configurability enables the signal processing module 16 to receive external inputs 12 having different characteristics and ranges and to provide variable sampling rate, filtering and gain of the external inputs 12 based upon such characteristics and range and/or the specific application. For example, if the present invention is utilized in a biomedical environment, EEG diagnosis and monitoring for instance, the sampling rate will need to be much higher than it would be for an industrial setting measuring thermocouple readings. The ability to reconfigure the system for varying signal characteristics arises at three separate levels in the present invention. For maximum flexibility, such reconfiguration can be carried out during a series of measurements by means of the wireless link,

which is understood in this context to be bidirectional. Depending on the characteristics of the received signal 18, the base station 40 can command the signal processing module 16 to reconfigure the input means 22 and/or A/D means 24 to accept an external input 12 of larger amplitude, or a different frequency range, where signal characteristics change significantly during the course of a series of measurements. Alternatively, for cost, size, and power advantages, this adjustment could be carried out prior to a series of measurements, with the configuration information stored in memory in the signal processing module 16, where this memory is advantageously implemented in a nonvolatile form such as EEPROM 261, allowing the configuration information to be retained, for instance, across power outages and obviating the need for module receiver 29 and base transmitter 84, saving cost. A third alternative, which provides advantages in certain technical parameters, is to arrange the implementation of the signal processing module 16 such that minor changes in component values or parameters can reconfigure the same basic hardware to accept widely divergent external input 12 types. This reconfiguration could take place at the factory, providing cost and inventory advantages to the manufacturer, or it could be performed by the end user, providing similar cost advantages to the user in allowing one piece of equipment to perform multiple tasks.

A number of configurable components are shown in FIG. 4. Any given component of this arrangement, though, may be omitted, and, in some cases, the order of the components may be changed to gain certain advantages such as physical size, power consumption, or cost, without changing the basic spirit of the invention. Components in this FIG. 4 may be combined, either by having a single component carry out the function of two or more of the components shown or by combining functions within a single package such as an integrated circuit or hybrid module. Certain components may also operate with a fixed configuration, limiting the flexibility of certain parameters while retaining the advantages of

configurability in other components.

The external input 12 inputs to the input protection network 221, which protects the signal processing module 16 against damage caused by faults or unanticipated conditions encountered at the external inputs 12. Depending on the rigors expected to be encountered in any given application and the tolerance to size and weight, the input protection network 221 may be omitted, may consist of a simple resistor network, or may include more elaborate protection such as diodes, zener diodes, transorbs, gas discharge tubes, and other components commonly known to those of ordinary skill in the art. Typically, the input protection network 221 is not configurable but its configurability in the present invention provides advantages in certain applications. Configuration options can include adjustable limits on input voltage and/or current as well as rates of change of those parameters, and other electrical parameters as well. These configuration changes can be achieved by changes to component values on a common platform for smallest size, or can be changed under processor control by means of various switches such as relays. A signal within normally expected ranges passes essentially unchanged to the measurement type means 222.

The measurement type means 222 allows selection of the external input 12 configuration. The measurement type means 222 may be used to configure the input circuitry to accept external inputs 12 which are single-ended voltage (a voltage with respect to a common reference shared between several signals), differential voltage (voltage between two defined conductors), differential current (current flowing through a conductor), single-ended current (current flowing to a common reference), frequency, capacitance, inductance, resistance, impedance, conductivity, or any other electrical parameter. The measurement type means 222 converts the external input 12 to a common parameter such as voltage or current, which can be interpreted by the succeeding blocks regardless of the original type of external signal 12 measured. One input channel can be built with several

different measurement type means, which can be selectively enabled by means of an analog switch, such as that found in the AD7714 chip in the present invention. It is understood that the AD7714 chip can provide many of the functions of the A/D means 24 and the input means 22 thus reducing the overall size of the signal processing module 16. In the preferred embodiment, the output of the measurement type means 222 is a varying voltage carrrying the information which was present in the original signal, or in certain cases, a series of voltage measurements, which are then conveyed to the prefilter 223.

The prefilter 223 allows rejection of external inputs 12 of large signals which are outside the frequency band of interest, so that such signals do not saturate the low-noise preamplifier 224. The prefilter 223 can be advantageously arranged to be a relatively simple filter to provide cost, size, and power advantages, because it need only reject out of band signals to the extent necessary to protect the low-noise preamplifier 224. A typical application might use a simple "R-C" filter to reject offset voltages in an AC-coupled application, or to reject extremely high frequencies which fall well beyond the frequency band of interest, or a combination of the two. Configurability of this section can be limited to simply enabling or bypassing the prefilter 223, or may be more elaborate in allowing selection of cutoff frequencies. In the preferred embodiment this prefilter consists of a simple RC filter which can be bypassed under firmware control, to minimize noise injection; however, an alternate embodiment could incorporate electrically adjustable components such as electronic potentiometers or varactors to provide even more flexibility at the expense of size and noise injection. The prefiltered signal is then passed to the low-noise preamplifier 224.

The low-noise preamplifier 224 is advantageous in certain applications to allow application of gain to the external input 12 early in the signal chain, before significant noise is introduced by the inherent characteristics of certain components, such as thermal noise. Configurability of the gain applied at this step

provides an advantage in allowing the present invention to accept larger external inputs 12 using a low gain (unity gain or lower), or alternatively to accurately measure very small external inputs 12 with minimal noise by using higher gain. This gain can be selectively chosen to be either a fixed value or unity gain under processor control by means of the signal selector built into the AD7714 used in the preferred embodiment, or can be designed to allow a selection of one of several gains by means of analog switches combined with a plurality of gain setting resistors. Gain applied at this stage has the net effect of dividing any downstream noise by the gain factor applied here. This more robust signal output by the preamplifier 224 is then passed to the AC coupling filter 225.

The AC coupling filter 225 is a highpass filter used to allow the system to reject the DC offset or steady state value of an external input 12 wherein the offset is not of interest, allowing additional gain to be applied to the changes in the external input 12. For instance, bioelectric signals such as EEG, EMG, or ECG are normally of interest only for the changes in those signals, and the absolute offset level is not of interest for diagnostic purposes. The cutoff frequency may be configured to allow adjustment of various parameters such as settling time, or may be adjusted to zero to effectively bypass the AC coupling filter 225. In the preferred embodiment, the filter may be bypassed by use of the signal selector switch in the AD7714; however, the use of adjustable components such as electronic potentiometers or varactors would allow more flexibility in choosing the cutoff frequency, at the expense of size and power consumption. The resulting signal, now stripped of any interfering DC offset if so configured, is then passed to the antialias filter 226.

The antialias filter 226 is a lowpass filter required to guard against false signals caused by aliasing between external input 12 content and sampling rate of downstream sampling functions such as multiplexing or analog-to-digital conversion. The Nyquist sampling theorem shows that any frequency content in

the sampled signal which is higher than one-half the sampling rate of the sampling function will cause aliasing, which results in false signals. In practice the antialias filter 226 is more commonly set to a smaller fraction of the sampling rate, usually between 1/4 and 1/10 the sampling rate. Regardless of the rate or ratio used, the cutoff frequency of the antialias filter 226 must change when the sampling rate changes significantly, to retain the most advantageous ratio of the sampling rate to the filter passband. The programmable cutoff frequency of the antialias filter 226 is thus required to allow for variable sampling rates. In the preferred embodiment, the high sampling rate of the delta sigma modulator in the AD7714 permits the use of a simple fixed RC type filter, with the anitalias filtering begin provided as an inherent digital filter in the AD7714; however, an alternate embodiment might use a switched capacitor filter such as the MAX7409 or other filter with a programmable cutoff frequency. The resulting filtered signal is then conveyed to the programmable gain amplifier 241 in the A/D means 24.

The programmable gain amplifier 241 adjusts the external input 12 amplitude to match the amplitude accepted by the A/D converter 242. In the preferred embodiment this programmable gain amplifier is included in the AD7714 integrated circuit, but this function could also be provided with a dedicated programmable gain amplifier, or alternatively through the use of analog switches or adjustable components such as potentiometers or DACs. If too much gain is applied, the programmable gain amplifier 241 itself or downstream components will saturate, introducing severe distortion and usually rendering the external input 12 unmeasureable. If, on the other hand, insufficient gain is applied here, the quantization noise of the analog-to-digital conversion process comes to dominate the external input 12, causing a severe degradation in the signal-to-noise ratio. For instance, a typical 16-bit A/D converter 242 can distinguish between 2.sup.16 or 65536 distinct levels. With an A/D converter 242 input range of .+-.3 volts, each level reperesents 92 .mu.V. If insufficient gain is applied to the

external input 12 such that the total signal swing is only 200 .mu.V, the A/D converter 242 will convert at most three distinct levels, rendering fine features of the external input 12 totally illegible. The module microcontroller 26 therefore adjusts the gain applied in the programmable gain amplifier 241 such that the expected external input 12 as processed and filtered by the preceding elements as described above, is amplified to cover as much of the A/D converter 242 input range as practical, or some other gain which optimizes signal features of interest. Additionally, in some applications it is advantageous to have the module microcontroller 26 adjust this gain dynamically depending upon the actual measured external input 12. For instance, the module microcontroller 26 might increase the programmable gain amplifier 241 gain when a measured external input 12 is very small, and then decrease the gain to avoid saturation when the external input 12 amplitude increases. This automatic gain control provides an increase in the total dynamic range achievable by the system without requiring expensive, large, and power-hungry components such as very high resolution A/D converters 242. The signal resulting from application of the specified gain is then passed to the A/D converter 242.

At least two parameters of a typical A/D converter 242 can be readily adjusted to achieve various goals as the situation dictates. First, the sampling rate may be adjusted to balance the conflicting goals of high fidelity measurements and low digital data rate. Where a signal has no high frequency content of interest, the sampling rate may be adjusted to a very low rate to minimize the demands on downstream processes such as digital filtering or telemetering of the data. On the other hand, sampling an external signal 12 with significant high-frequency content of interest demands a higher sampling rate. In the preferred embodiment, the sampling rate is programmable via the AD7714; in other implementations the sampling rate can be made adjustable by means of an externally applied sampling clock to an A/D converter. The adjustable sampling rate allows the controller to

adapt the A/D converter 242 to best meet the system demands of the moment.

In a similar fashion, selection of the resolution provided by the A/D converter 242 must balance faithful reproduction of the external input 12 against total digital data rate. Depending on the particular A/D converter 242 used, there may also be a tradeoff of the maximum achievable sampling rate against the selected resolution, wherein selection of a higher resolution lowers the maximum attainable sampling rate. Again the module microcontroller 26 can adjust this parameter to best meet the system requirements, selecting higher resolution when smaller changes in the measured signal amplitude must be reported, and lower resolution when the lack of such a requirement allows advantages in the form of either a higher sampling rate or a lower digital data rate. In the preferred embodiment, the AD7714 can be programmed to either 16 bit or 24 bit resolution, and the firmware running in the microcontroller can selectively transmit 8, 12, 16, or 24 bits of the acquired data. The digital filter 243, the module microcontroller 26, or other downstream process can also reject certain portions of the digital data stream to provide an effective decrease in resolution where this decrease is advantageous, especially when the data must later cross a bandwidth-limited link such as a RF, IR or optical link. The A/D converter 242 passes the signal, now in the form of a succession of digital values, to the digital filter 243 for further processing.

The digital filter 243 extracts external input 12 parameters of interest while rejecting other signals, commonly referred to as noise. Implementation of the digital filter 243 could alternatively be in the form of analog filters applied anywhere in the signal chain prior to the A/D converter 242, but implementation as a digital filter 243 provides advantages as to programmability, calibration, drift, and accuracy. The digital filter 243 could be implemented in many forms, depending upon the demands of the particular application. In the preferred embodiment, the digital filter is inherent in the analog to digital conversion

process inside the AD7714, but it is understood that the digital filter 243 could be implemented as firmware inside the module microcontroller 26 itself, or as a digital signal processor, or as a specialized integrated circuit, or by some other means. Regardless of implementation, the programmability of the digital filter 243 allows the system to readily adapt to changing measurement requirements, whether those changes are brought about by changes in the environment, changes in the external input 12 itself, or changes in the focus of the overall system. The resulting output from the digital filter 243 is a stream of digital values, ready for further processing such as assembly into the desired format for transmission by the firmware.

Referring now to FIG. 5 there is shown a block diagram of the firmware of the present invention. The signal processing module 16 firmware defines several modes of operation 100. There are several "test" modes which are used during factory calibration of the device. In addition, there are several operation modes which have mode-specific configuration. For example, the signal processing module 16 can be programmed to operate in a first operational mode in which it transmits calibration data (used to properly zero the analog inputs) for the first three seconds of operation (or for some other predetermined time), and then switches to a second operational mode which transmits analog signal information as collected from the A/D converters 242. The configuration for each mode of operation is programmed in the non-volatile memory EEPROM 261.

Once power is first applied to the signal processing module 16, the module microcontroller 26 performs the basic device initialization, including proper configuration of the I/O ports and internal variables 102. Next, the module microcontroller 26 reads the initial device configuration 104 from the EEPROM 261. This configuration controls the input means 22 of the signal processing module 16, including the number of external inputs (also herein referred to as channels), the resolution of the A/D converter 242, and the sampling rate of each

individual input channel. This configuration also controls the operation of the module transmitter 28 in the signal processing module 16, including the carrier frequency, modulation type, output power control, and the length in bytes of each transmitted RF message packet. This configuration also describes the initial mode of operation for the signal processing module 16.

Once the initial configuration has been read, the module microcontroller 26 enters the first mode of operation described in the configuration. It reads the mode-specific configuration 106, which includes the state of the module transmitter 28 and the analog inputs as used in the mode. This configuration can reside in EEPROM 261 or in module microcontroller 26 memory. The module microcontroller 26 then initializes all the peripheral devices according to this mode configuration 108. In the special case that this is the "shutdown" mode, the module microcontroller 26 will perform a software power-down 110.

Once the mode has been initialized, the module microcontroller 26 begins execution of the interrupt service routine (ISR) 112, which is responsible for transmitting the data in the form of messages along the modulated RF carrier. Operation of the interrupt service routine is asynchronous and distinct from the mainline code, and is described later.

The module microcontroller 26 begins execution of the mode-specific "opcodes" 114, which are a sequence of instructions contained either in EEPROM 261 or in the module microcontroller 26 memory. These opcodes are performed for each operational mode. The module microcontroller 26 reads the first operational code from the EEPROM 261 and interprets the opcode, performing an appropriate action: If the opcode instructs the module microcontroller 26 to change modes 116, the module microcontroller 26 terminates the ISR 118 and returns to the mode initialization, and begins execution of a new operational mode; if the opcode instructs the module microcontroller 26 to begin a loop construct 120, the module microcontroller 26 begins the loop by initializing a

loop counter variable 122; if the opcode instructs the module microcontroller 26 to end a loop construct, the module microcontroller 26 increments the loop counter variable and determines if the loop is complete 124. If not, the module microcontroller 26 resets the index of current opcode to the beginning of the loop, otherwise it sets the index of the next opcode to after the loop; if the opcode instructs the module microcontroller 26 to initialize a single A/D converter 242, the module microcontroller 26 will perform the specified calibration 126; if the opcode instructs the module microcontroller 26 to the read a single A/D converter 242, the module microcontroller 26 will take the reading and insert the data into the current message to be transmitted over the RF carrier 128; if the opcode instructs the module microcontroller 26 to insert a special byte of data into the RF message, the module microcontroller 26 will insert this data into the message 130. This special message byte may include an identifier to uniquely identify the signal processing module 16, an error check field such as a cyclic redundancy check, or some data representing the internal state of the signal processing module 16 such as the RF frequency, measured temperature, etc.

After each opcode has been read and interpreted, the module microcontroller 26 determines if the RF message has been completely filled and is ready to be transmitted over the RF carrier 132. If it has, the module microcontroller 26 marks a flag variable for the interrupt service routine to begin transmitting the RF message 134.

Next, the module microcontroller 26 performs any housekeeping tasks, such as updating the RF tuning parameters based on changes in temperature, updating timers, etc. 136. Finally, the module microcontroller 26 returns to execute the next opcode in the sequence 114.

Referring now to FIG. 6 there is shown a block diagram of the software programming function of the ISR 150. The ISR is responsible for transmitting the individual message bytes over the RF carrier. The ISR is executed by a hardware

interrupt which occurs immediately before every byte to be transmitted over the RF carrier. The ISR detects whether an RF message is completely filled 152. If the ISR detects (based on the flag variable) that an RF message is not yet completely filled by the main code, the ISR transmits a "filler" byte, or a byte with an even number of "1" and "0" bits 154. This acts to maintain an even (50%) modulation duty cycle on the carrier frequency.

Once the ISR detects that the main code has filled an RF message to be transmitted, it transmits the RF sync bytes 156. These are two unique bytes transmitted at the beginning of every RF message which are easily identified by the base station 40 as the start of a message.

Once the RF sync bytes have been transmitted, the ISR transmits each message byte of the RF message, in sequence 158. Once the RF message has been completely transmitted 160, the ISR resumes transmitting filler bytes until the next RF message is filled by the main code.

Because of the phase locked loop based frequency synthesizer used in the present invention, the module transmitter 28 and base transmitter 84 are frequency agile over the frequency range. Since the module receiver 29 and the base receiver 80 employ automatic frequency control, the present invention consumes relatively low power as the module transmitter 28 and base transmitter 84 can be intermittently powered down without loosing reception due to drift or sacrificing data transmission accuracy. The utilization of programmable firmware allows inexpensive and flexible operation for the inputting, conditioning and processing of any type, character and range of the external inputs. This also allows the module microcontroller 26, in response to the variation of the external inputs 12 or, in response to instructions received by RF signal through the module receiver 29, to adapt the signal processing module 16 based upon the variations allowing the signal processing means 16 to input, condition, process and transmit said external input notwithstanding said variation. The present invention performs this

adaptation without the need to modify or alter hardware or select or use different hardware already present in the device. In other words all adaptation can be accomplished by software programming totally.

One or more sensors are used to develop the data or signals used in the present invention for determining a quantitative level of severity of a subject's sleeping disorder and/or symptoms. In various embodiments, preferably at least two EEG electrodes are used to develop this data. In other embodiments, preferably, at least two ECG electrodes are used. In still other embodiments, preferably a pulse oximeter is used. In still even other embodiments, preferably, either an O^2 or CO^2 blood gas monitor is used.

The signals from the one or more sensors used in various embodiments of the present invention are preferably analyzed using a processor and software that can quantitatively estimate or determine the severity of the subject's sleeping disorder or symptoms. Using either the microcontroller 26 of a data acquisition system, a separate computer, base station or processor, a PDA, a processor on a device for treating the subject's sleeping disorder or a combination of these processors, the severity of the subject's sleeping disorder and/or symptoms is determined and is used at least in part to regulate the physical or chemical treatment of the subject. Also optionally, the one or more sensors used in the system of the present invention can also be tethered to a computer, base station, cell phone, a PDA or some other form of processor or microprocessor.

The processor or microprocessor of various embodiments of the present invention can be part of a remote communication station or base station. The remote communication station or base station can also be used only to relay a pre- or post-processed signal. Preferably, the remote communication station or base station can be any device known to receive RF transmissions such as those transmitted by the wireless data acquisition system described herein. The remote communication station or base station by way of example but not limitation can

include a communications device for relaying the transmission, a communications device for re-processing the transmission, a communications device for re-processing the transmission then relaying it to another remote communication station, a computer with wireless capabilities, a PDA with wireless capabilities, a processor, a processor with display capabilities, and combinations of these devices. Optionally, the remote communication station can further transmit data both to another device including the subject's treatment device and/or back. Further optionally, two different remote communication stations can be used, one for receiving transmitted data and another for sending data. For example, with the sleep diagnosis and treatment system of the present invention, the remote communication system of the present invention can be a wireless router, which establishes a broadband internet connection and transmits the physiological signal to a remote internet site for analysis, preferably for further input by the subject's physician or another clinician. Another example is where the remote communication system is a PDA, computer or cell phone, which receives the physiological data transmission, optionally re-processes the information, and re-transmits the information via cell towers, land phone lines, satellite, radio frequencies or cable to a remote site for analysis. Another example is where the remote communication system is a computer or processor, which receives the data transmission and displays the data or records it on some recording medium, which can be displayed or transferred for analysis at a later time.

The quantitative method for estimating or determining the severity of the subject's sleeping disorder or symptoms is preferably accomplished by using signals or data from the one or more sensors described herein. More preferably, this quantitative method is accomplished in real-time, allowing the subject's symptoms to be treated as they occur. By real-time it is meant that the quantitative diagnosis step is accomplished predictively or within a short period of time after symptoms occur which allows for immediate treatment, thereby

more effectively reducing the health affects of such disorder while at the same time also minimizing side effects of the treatment chosen. By real-time, preferably the diagnosis is accomplished within 24 hours of receiving the signals from the one or more sensors on the subject, more preferably within 8 hours, even more preferably within 4 hours, still even more preferably within 1 hour, still even more preferably within 20 minutes, still even more preferably within 5 minutes, still even more preferably within 1 minute, still even more preferably within 10 seconds, still even more preferably within 1 second, still even more preferably within 0.1 seconds and most preferably within 0.01 seconds.

Various algorithms known to those skilled in the art are used to filter out noise from the signal or data, and to then quantify the level of severity of the subject's sleeping disorder or symptoms. This filtered data is then is preferably analyzed using the techniques described in the following paragraph In addition to these sleeping disorder data or signal analysis techniques various controller schemes can be used.

Various sleeping disorders have symptoms that can be predicted based on various combinations of physiological signals or data. Various embodiments of the present invention include the approach to identifying these symptoms prior to onset by identifying various characteristic shifts in the power spectrum of the sensors being used to monitor these physiological conditions. This characteristic shift in these signals or data can be identified and used to trigger an actuator on the physical or chemical treatment device(s) to provide for delivery of a certain level of treatment. The various embodiments of the present invention include but are not limited to the following signal-processing techniques that are utilized to predict the onset of these symptoms. These are: (i) the standard deviation technique, (ii) a recursively fit ARMAX system identification model, (iii) the Short-Time Fourier Transform (SFFT) technique, and (iv) time-frequency signal analysis with a variety of different kernels. The present invention would also

include other on-line signal processing algorithms known to those skilled in the art, such as wavelet analysis, which is similar to time-frequency analysis with a particular kernel function, to identify the shift in power spectrum associated with imminent flow separation that is discussed herein.

The standard deviation technique operates on the principle that there is an increase in pressure fluctuation as the flow begins to separate from the surface of an airfoil, due to either increasing angle of attack or unsteady flow. A sharp increase in the standard deviation of pressure data is observed immediately prior to stall. To trigger the deployment the flow effectors and initiate fluid flow control, a threshold standard deviation can be calculated for each pressure sensor and programmed into the control strategy.

The second embodiment of a method to identify the shift in measured power spectrum of the signal from the pressure transducer to identify stall utilizes a recursively identified system model, particularly an Auto-Regressive Moving Average (ARMA) model. Advantageously, the controller is the ORICA™ controller, an extended horizon, adaptive, predictive controller, produced by Orbital Research, Inc. and patented under U.S. Patent No. 5,424,942, which is incorporated herein by reference. The ARMA recursive identification method attempts to fit specific models to the measured data or signals. Evaluation of this data reveals distinct, identifiable model order shifts based, which can be used to actuate the treatment device at various levels. Further analysis of the frequency spectrum of the physiological data related to various sleeping disorders reveals recognizable changes in this data or signals. This clear characterization alongside the model order shifts allows the *ORICA* identifier to classify discrete models based upon various physiological conditions of the subject, thus allowing precisely controlled treatments to be delivered to the subject or patient. A simple function minimization based upon the error associated with each model will enable adaptive model selection for the subject's physiological condition. As the

subject's physiological conditions moves toward various critical conditions or symptoms, the model with the best fit to the data will shift into a higher order model. This model shift foretells the onset of the symptom. A second sub-method of identifying impending symptoms using the ARMA and other related models is to track the poles of the identified system model based on the subject over time. As the subject's physiological condition moves toward certain designated critical symptoms, the poles of the identified system model will move toward a condition of symptom onset, thereby indicating to the control system that certain critical symptoms are impending. Either of these two signal identification techniques based on fitting a mathematical model to the system can be utilized to predict the onset of the subject's symptoms. The ARMA model can be adapted to resemble other canonical model forms thereby demonstrating similarity to other system identification methods based on Kalman filtering and similar approaches.

A third embodiment of a method for quantifying the power spectrum measured by the one or more sensors is by using Short-Time Fourier Transforms (STFT). A Discrete Fourier transform (DFT), and its numerically efficient complement the Fast Fourier Transform (FFT), both provide frequency information of a digitized signal or data from the sensors. The DFT and FFT both assume that the signal that is being measured is stationary in time. However, in the case of the subject being tested and treated, the measured signal or data is not stationary in time, which means a typical DFT / FFT approach is inapplicable. However, for short time periods the signal maybe considered to be stationary. Therefore, it is possible to estimate the mean power spectrum by segmenting the physiological data or signals into epochs lasting anywhere from 0.1-5 seconds each, and then applying a discrete-time Fourier transform (DFT) to the windowed data. The DFT is used to calculate the power spectrum of the signal for that epoch. Then the spectral mean and median density are calculated from the power

spectrum of the signals from each epoch. Using this method it is possible to identify specific frequency content in the data. As the subject begins to experience the onset of various critical symptoms, the frequency spectrum of the measured and analyzed data will shift, which indicates to the control system that the symptom is beginning.

A fourth embodiment of a signal processing method which can provide indications to the control system that various symptoms are impending, to enable either actuation of the treatment device, is to analyze the sensor data using a time-frequency transform. A time-frequency transform enables both frequency resolution and estimation stability for highly non-stationary signals, which typifies some types of such as some of the data or signals related to various physiological conditions. This is accomplished by devising a joint function of both time and frequency, a distribution that describes the energy and density of a signal simultaneously in both time and frequency. The general form of the time-frequency transform is given by the following

$$P(t,w) = \frac{1}{4\Pi^2}\iiint e^{-j\theta t - j\tau\omega + j\theta u}\phi(\theta,t) \cdot s^*\left(u-\frac{1}{2}\tau\right)s\left(u+\frac{1}{2}\tau\right)\,du\,d\tau\,d\theta$$

This transform can be used to calculate instantaneous power spectra of a given signal. The actual transformation distribution is selected by changing the kernel, $\Phi(\theta,\tau)$. The function [e-1] is interesting since it is possible to identify any distribution invariant to time and frequency shifts by means of its kernel, and the properties of the kernel are strictly related to the properties of the distribution, given by [e-1].

The diagnostic device of the present invention is used to provide an output which is then used either automatically to adjust the treatment device or by a clinician or the subject to adjust the device which provides the physical or

chemical treatment device which is another part of the system of the present invention. There are clearly many embodiments of the present invention, and we will attempt to describe a few herein.

Various embodiments of the present invention include a device for physically or chemically treating a subject's sleeping disorder, which can be adjusted using the output of the level of severity of the subject's sleeping disorder. Physical and chemical methods to treat sleeping disorders are known to those skilled in the art. With the sleep disorder treatment system of the present invention those as well as new physical and chemical treatments can be used and developed for treating a subject's sleeping disorder because the system of the present invention allows for direct treatment of the disease and particularly of symptoms as they occur. Physical methods to therapeutically treat sleeping disorders and symptoms of these disorders include continuous positive airway pressure (CPAP), electrical stimulation of the muscles and nerves, and the like. Chemical methods to therapeutically treat sleeping disorders and symptoms while less common include various pharmaceutical agents with various delivery techniques including oral delivery, injection, transdermal delivery, injection with a controlled pump, inhalation therapy and the like.

The present invention is envisioned to be particularly valuable in the treatment of sleep apneas. With the present invention it is envisioned that modifications can be made to a subject's treatment regiment as the severity or level or the subject's symptoms increase or decrease better regulating the therapeutic treatment of the subject's sleeping disorder. For example, with a subject who has sleep apnea, delivery of a physical treatment such as CPAP can be adjusted during the treatment based on the sleep diagnosis results. The CPAP machine would preferably be set up to receive some type of signal, which would cause an adjustment in the flow rate or pressure of the breathing gas being delivered to the subject.

FIG. 7 shows a schematic view of one embodiment of a device that can be used to physically treat a subject's sleep disorder, which can be further adjusted using the output of the level of severity of the subject's sleeping disorder. More particularly, FIG. 7 shows a particular type of physical treatment device known as continuous positive airway pressure (CPAP) device. This conventional pressure support system 310 shown in FIG. 7 includes a pressure generator 312, a blower, piston or bellows, that receives a supply of gas from a gas source, such as ambient atmosphere, as indicated by arrow A, or pressurized gas tanks (not shown) and creates a flow of breathing gas, as indicated by arrows B, having a pressure greater than the ambient atmospheric pressure. A patient or subject circuit 314, which is typically a flexible conduit, delivers the elevated pressure breathing gas to the airway of the subject. Typically the subject circuit is a single limb conduit or lumen having one end coupled to the pressure generator and a patient interface device 316 coupled to the other end.

The subject interface device 316 connects the subject circuit 314 with the airway of the subject so that the elevated pressure gas flow is delivered to the subject's airway. Examples of subject interface devices include but are not limited to nasal masks, nasal and oral masks, full face masks, nasal canulas, oral mouthpieces, tracheal tubes, endotracheal tubes, hoods and the like. The single limb subject circuit shown in FIG. 7 also includes an exhalation port 318, also commonly referred to as an exhalation vent, exhaust port, or exhaust vent, to allow gas, such as expired gas from the subject, to exhaust to the atmosphere, as indicated by arrow C. Generally, the exhaust vent 318 is located in the subject circuit 314 near the subject interface device 316 or in the subject interface device itself.

A more sophisticated pressure support device of the present invention includes a flow sensor 320, pressure sensor 322, or both that monitor the flow and/or pressure of gas passing in the subject circuit 314. The flow information

can also be used to determine the volume of gas passing through the subject circuit 314. The information from the flow sensor 320 and/or pressure sensor 322 is used, for example, to control the pressure or flow of gas provided to the subject, monitor the condition of the subject, monitor the usage of the pressure support device, any combination thereof, or the like.

FIG. 8 shows a schematic view of one embodiment of the sleep disorder treatment system of the present invention. In FIG. 8, a subject 410 is hooked up with a number of sensors 420, 424, 418, and 426. The subject 410 in this case is shown with a respiratory mask 412, which is connected by an air hose or subject circuit 416 to a continuous positive air pressure device 428 similar to that shown in FIG. 7. The signal or data from one or more of these sensors is picked up in this embodiment by a diagnostic device 441, which comprises a radio 436 and antenna 434; a microprocessor 438 for processing the data or signals to determine a level of severity of the subject's sleeping disorder or symptoms; the diagnostic device then transmits a signal based on this level of severity by either a tether 444 or radio signal (not shown) to an actuator (not shown) in the CPAP device 428, which controls the flow of air or gas to the subject. The CPAP device 428 optionally has an O^2 tank connected, which can be used to increase the concentration of O^2 in the air being delivered to the subject. In addition, optionally the treatment device 428 has a sensor in the air hose 416, which can measure the differential pressure 414 and thereby accurately measure air flow provided to the patient. Also optionally, the device can have a nebulizer (not shown) with a reservoir and pump to injecting medication into the nebulizer.

It will be apparent to those skilled in the art that various modifications and variations can be made to the present invention without departing from the spirit and scope of the invention. Thus, it is intended that the present invention cover the modifications and variations of this invention provided they come within the scope of the appended claims and their equivalents.

WHAT IS CLAIMED:

1. A sleeping disorder treatment system comprising

a first device for diagnosing and creating a quantitative output of a level of severity of a subject's sleeping disorder or symptoms; and

a second device for physically or chemically treating a subject's sleeping disorder or symptoms, which can be adjusted using in part the output of the level of severity of the subject's sleeping disorder.

2. The system in Claim 1, wherein the first device for physically or chemically treating a subject's sleeping disorder is adjusted in real time.

3. The system in Claim 1, wherein the second device is adjusted automatically adjusted by using data or a signal from the first device.

4. The system in Claim 1, wherein the quantitative output of the level of severity of the subject's sleeping disorder or symptoms is based in part on a physiological signal of the subject.

5. The system in Claim 4, wherein the physiological signal is a brain wave signal.

6. The system in Claim 4, wherein the physiological signal is an EKG signal.

7. A sleep apnea treatment system comprising

a first device for diagnosing and creating an output of a level of severity of a subject's sleep apnea; and

a CPAP device for treating the subject's sleep apnea, which can be adjusted using the output.

8. The system in Claim 7, wherein the CPAP device for physically or chemically treating a subject's sleeping disorder is adjusted in real time.

9. The system in Claim 7, wherein the CPAP device is adjusted automatically using data or a signal from the first device.

10. The system in Claim 7, wherein the output of the level of severity of the subject's sleeping disorder or symptoms is based in part on a physiological signal of the subject.

11. The system in Claim 10, wherein the physiological signal is a brain wave signal.

12. The system in Claim 10, wherein the physiological signal is an EKG signal.

13. The system in Claim 7, wherein the first device sends a wireless signal based in part on the output level of severity to the CPAP device to adjust a treatment of the subject.

14. A sleep apnea treatment system comprising

a first device for diagnosing comprising at least two EEG sensors, and creating an output of a level of severity of a subject's sleep apnea; and

a CPAP device for treating the subject's sleep apnea, which can be adjusted using the output.

15. The system in Claim 14, wherein the second device for physically or chemically treating a subject's sleeping disorder is adjusted in real time.

16. The system in Claim 14, wherein the CPAP device is adjusted automatically using data or a signal from the first device.

17. The system in Claim 14, wherein the first device sends a wireless signal based in part on the output level of severity to the CPAP device to adjust a treatment of the subject.

18. The system in Claim 14, wherein the CPAP device further comprises a nebulizer.

19. The system in Claim 18, wherein the nebulizer is used to deliver medication.

20. The system in Claim 14, wherein the CPAP device is adjusted by a remote control device.

ABSTRACT

The present invention relates to an integrated sleep diagnosis and treatment device, and more particularly to an integrated apnea diagnosis and treatment device. The present invention additionally relates to method of sleep diagnosis and treatment.

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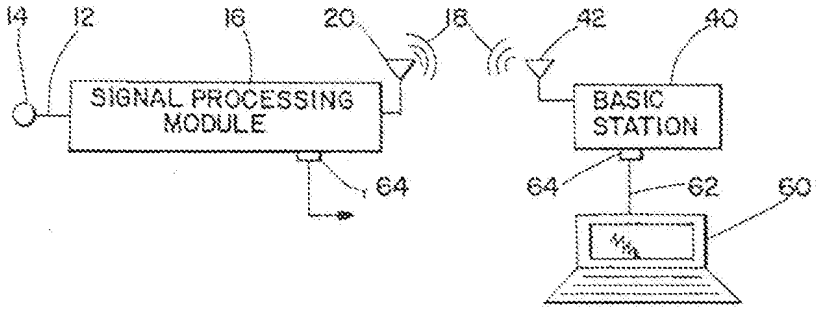


Fig. 1

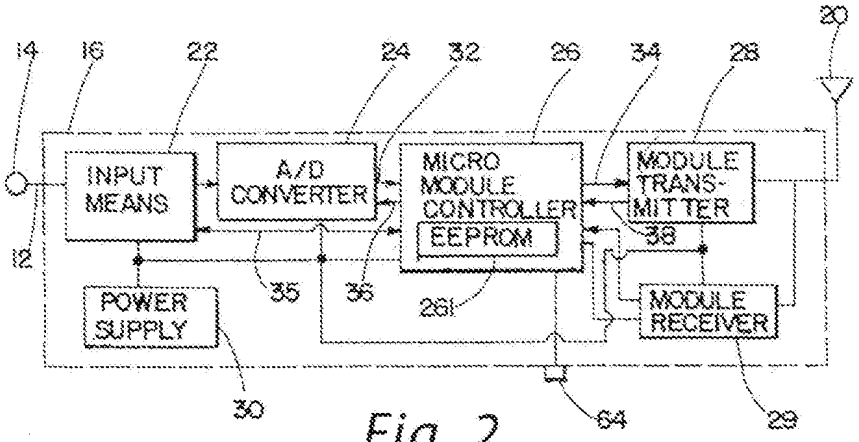


Fig. 2

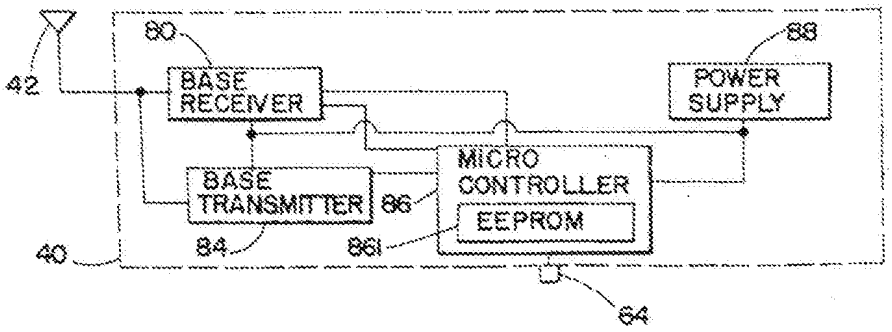


Fig. 3

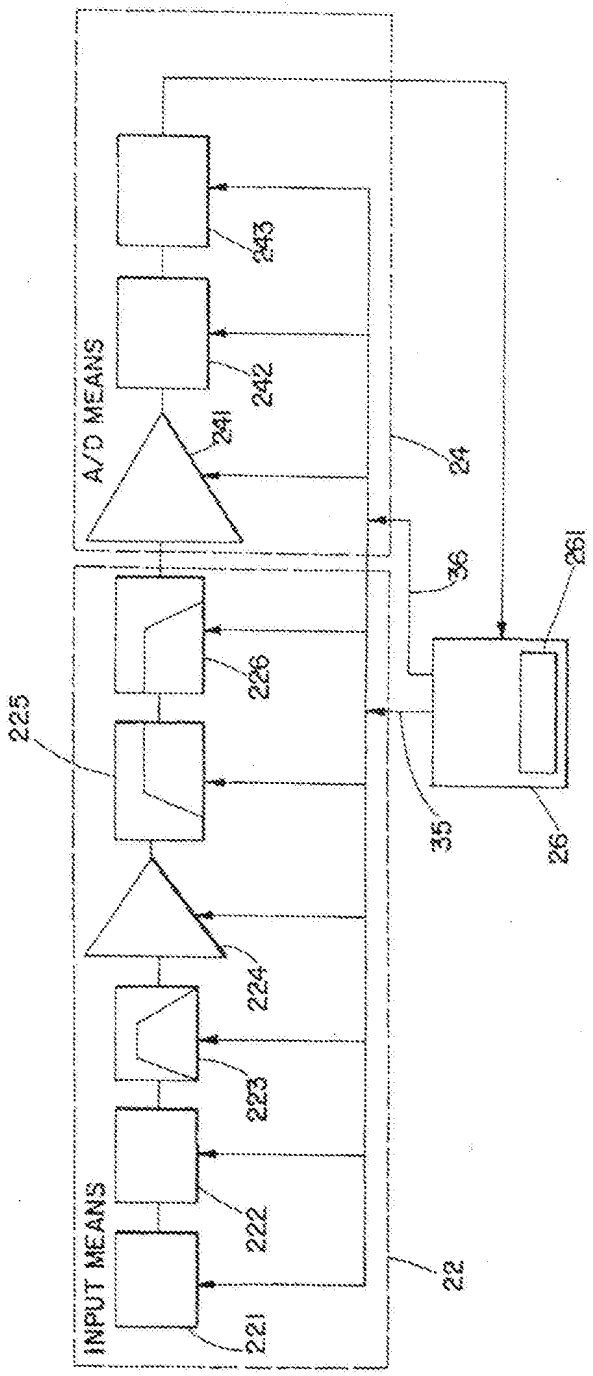

A/D MEANS
INPUT MEANS
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242
241
24
36
261
226
225
224
223
222
221
22
35
26

Fig. 4

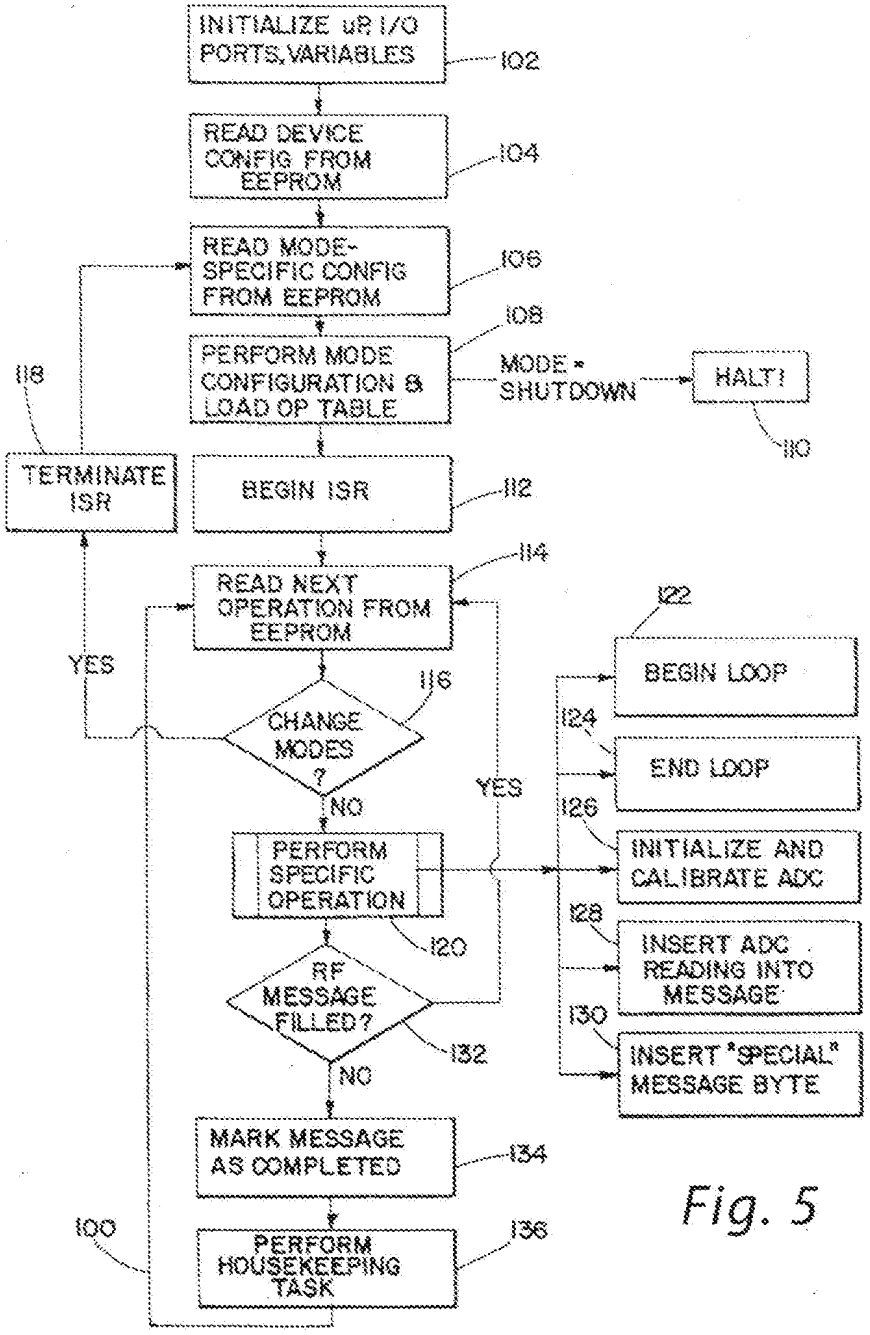

INITIALIZE uP I/O PORTS, VARIABLES
102
READ DEVICE CONFIG FROM EEPROM
104
READ MODE-SPECIFIC CONFIG FROM EEPROM
106
PERFORM MODE CONFIGURATION & LOAD OP TABLE
108
MODE = SHUTDOWN
HALT!
110
118
TERMINATE ISR
BEGIN ISR
112
READ NEXT OPERATION FROM EEPROM
114
YES
CHANGE MODES ?
116
NO
PERFORM SPECIFIC OPERATION
120
RF MESSAGE FILLED?
132
NO
YES
MARK MESSAGE AS COMPLETED
134
PERFORM HOUSEKEEPING TASK
136
100
122
BEGIN LOOP
124
END LOOP
126
INITIALIZE AND CALIBRATE ADC
128
INSERT ADC READING INTO MESSAGE
130
INSERT "SPECIAL" MESSAGE BYTE

Fig. 5

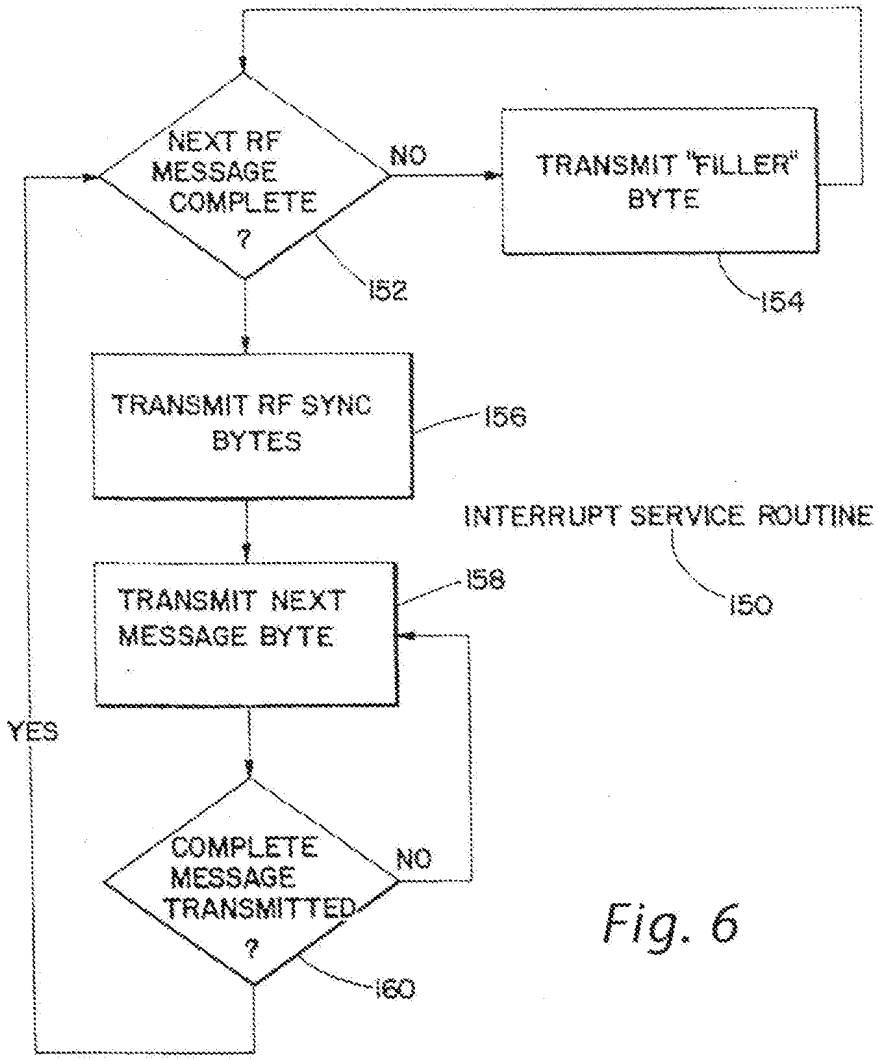

NEXT RF MESSAGE COMPLETE ?
NO
TRANSMIT "FILLER" BYTE
152
154
TRANSMIT RF SYNC BYTES
156
INTERRUPT SERVICE ROUTINE
150
TRANSMIT NEXT MESSAGE BYTE
158
YES
COMPLETE MESSAGE TRANSMITTED ?
NO
160

Fig. 6

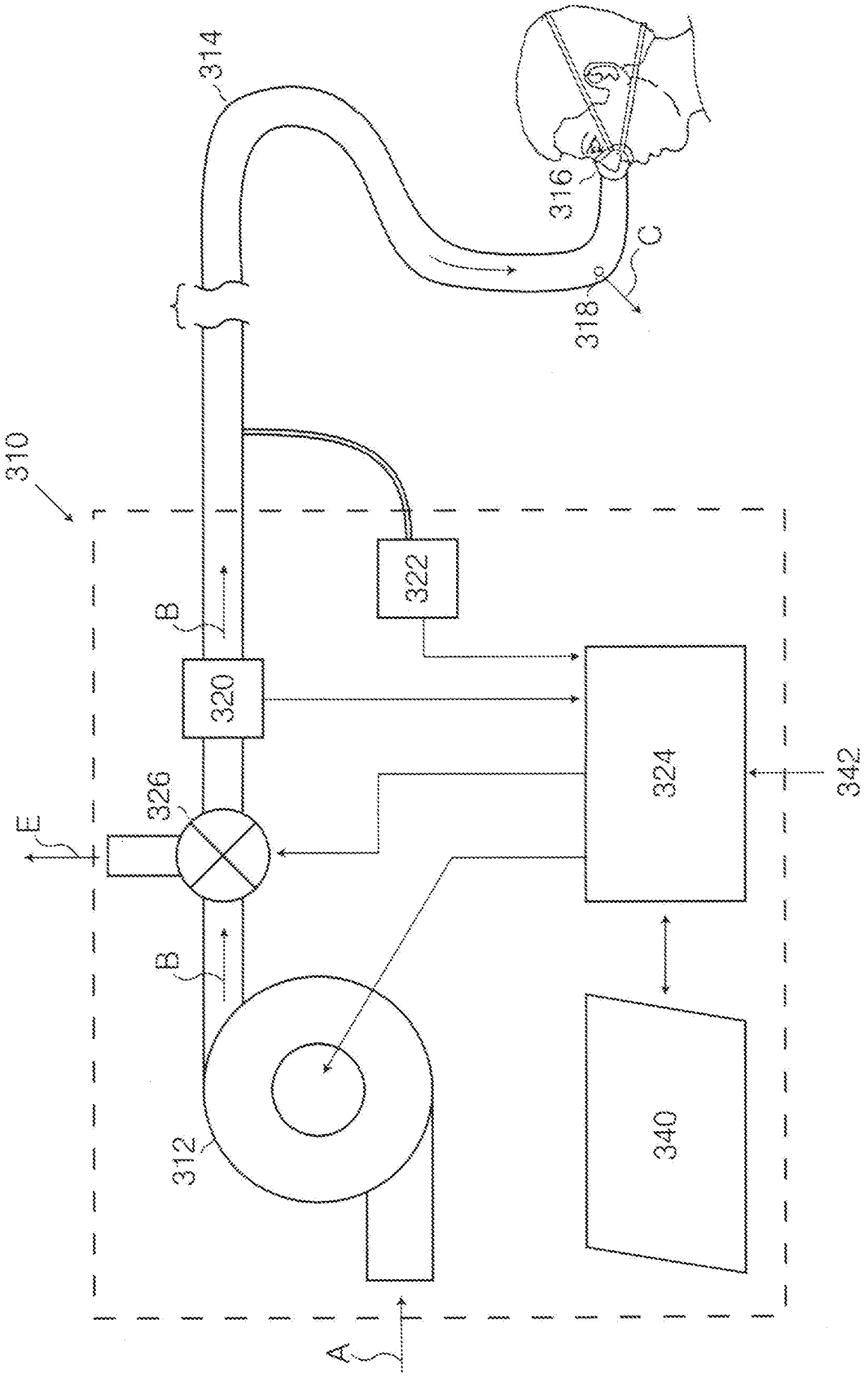


Fig. 7

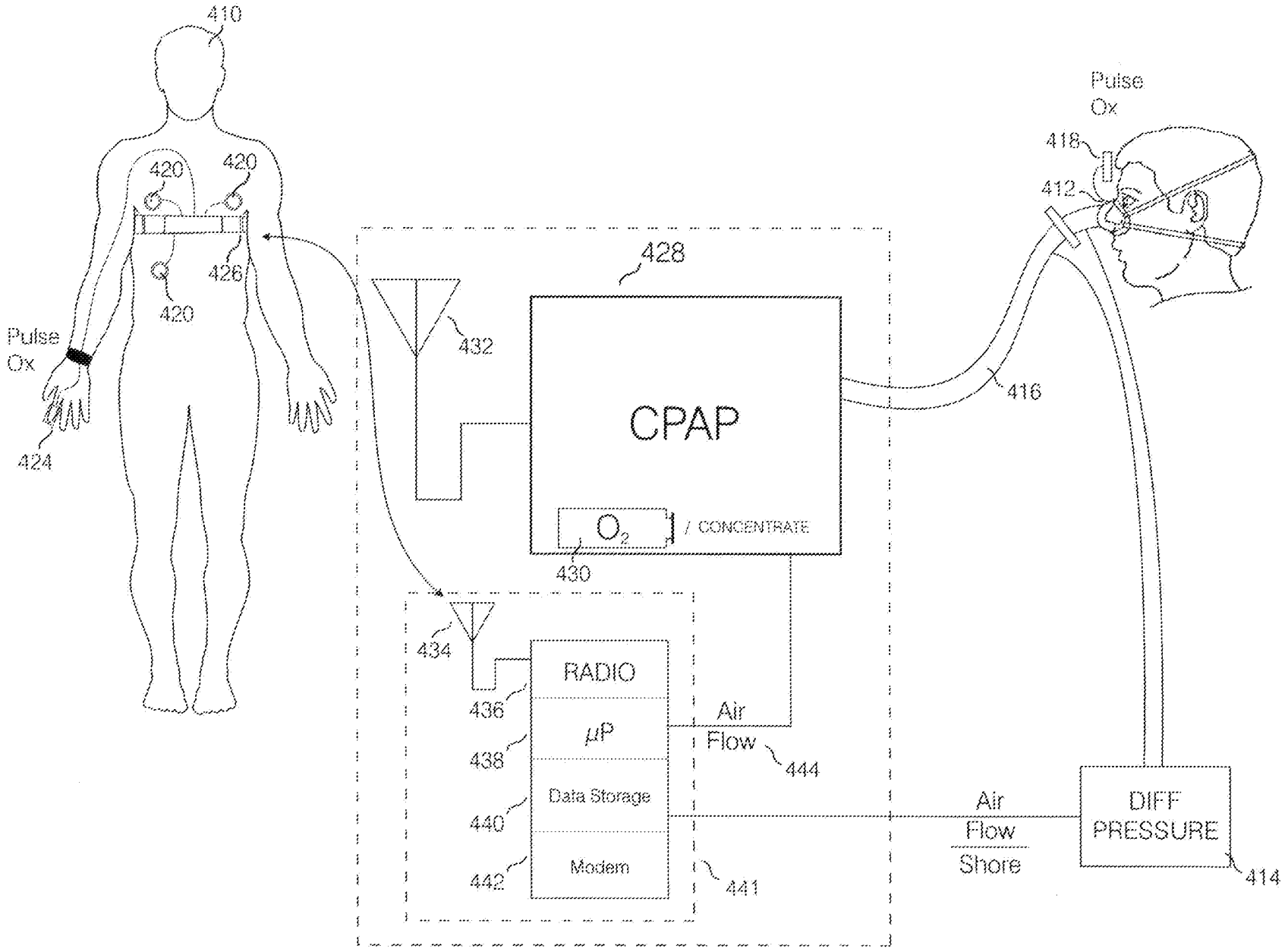


Fig. 8

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	CMD-105
	Application Number	
Title of Invention	Devices and Methods for Sleep Disorder Diagnosis and Treatment	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Hani		Kayyali	

Residence Information (Select One) ● US Residency Non US Residency Active US Military Service

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Mailing Address of Inventor:

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State/Province	OH
Postal Code	44122
Country	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Robert		Schmidt	

Residence Information (Select One) ◉ US Residency Non US Residency Active US Military Service

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Ft. Myers	FL	US

Mailing Address of Inventor:

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Address 2	
City	Ft. Myers
State/Province	FL
Postal Code	33967
Country	US

Inventor 3 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Mohammad		Modarres-Zadeh	

Residence Information (Select One) ◉ US Residency Non US Residency Active US Military Service

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	CMD-105
	Application Number	
Title of Invention	Devices and Methods for Sleep Disorder Diagnosis and Treatment	

City	Tampa	State/Province	FL	Country of Residence	US

Mailing Address of Inventor:

Address 1	17910 Arbor Greene Dr.
Address 2	
City	Tampa
State/Province	FL
Postal Code	33647
Country	US

Inventor 4 — Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Brian		Kolkowski	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Leroy	State/Province	OH	Country of Residence	US

Mailing Address of Inventor:

Address 1	6340 Taylor Rd.
Address 2	
City	Leroy
State/Province	OH
Postal Code	44077
Country	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	31177		
Email Address	bkolkowski@clevemed.com	Add Email	Remove Email

Application Information:

Title of the Invention	Devices and Methods for Sleep Disorder Diagnosis and Treatment		
Attorney Docket Number	CMD-105	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	6	Suggested Figure for Publication (if any)	1

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Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☒ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	● Customer Number	US Patent Practitioner	◯ Limited Recognition (37 CFR 11.9)
Customer Number	31177		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation of	13440116	2012-04-05

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	CMD-105
	Application Number	
Title of Invention	Devices and Methods for Sleep Disorder Diagnosis and Treatment	

Prior Application Status	Patented	Remove

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
13440116	Continuation of	11266899	2005-11-04	8172766	2012-05-08

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

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Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	CMD-105
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Title of Invention	Devices and Methods for Sleep Disorder Diagnosis and Treatment	

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	CMD-105
	Application Number	
Title of Invention	Devices and Methods for Sleep Disorder Diagnosis and Treatment	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1 — Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
Person to whom the inventor is obligated to assign.	Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Applicant:

Address 1			
Address 2			
City		**State/Province**	
Country		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. Add

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	CMD-105
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Title of Invention	Devices and Methods for Sleep Disorder Diagnosis and Treatment	

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

Remove

If the Assignee or Non-Applicant Assignee is an Organization check here. ☒

Organization Name	Cleveland Medical Devices Inc.

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1	4415 Euclid Ave., Suite 400		
Address 2			
City	Cleveland	**State/Province**	OH
Country i	US	Postal Code	44103
Phone Number	2167916720	Fax Number	2167916739
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add

Signature:

Remove

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Brian Kolkowski/			Date (YYYY-MM-DD)	2018-08-08
First Name	Brian	Last Name	Kolkowski	Registration Number	36847

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	CMD-105
	Application Number	
Title of Invention	Devices and Methods for Sleep Disorder Diagnosis and Treatment	

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1 The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3 A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent CooperationTreaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Docket No.
CMD-087

Declaration and Power of Attorney For Patent Application

English Language Declaration

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

the specification of which

(check one)

☒ is attached hereto.

☐ was filed on _____ as United States Application No. or PCT International Application Number _____

and was amended on _____

(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b) of any foreign application(s) for patent, or plant breeder's rights certificate(s), or 365(a) of any PCT International application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent, inventor's or plant breeder's rights certificate(s), or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)			Priority Not Claimed
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	☐
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	☐
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	☐

I hereby claim the benefit under 35 U.S.C. Section 119(e) of any United States provisional application(s) listed below:

(Application Serial No.)	(Filing Date)
(Application Serial No.)	(Filing Date)
(Application Serial No.)	(Filing Date)

I hereby claim the benefit under 35 U. S. C. Section 120 of any United States application(s), or Section 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. Section 112, I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, C. F. R., Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

(Application Serial No.)	(Filing Date)	(Status) (patented, pending, abandoned)
(Application Serial No.)	(Filing Date)	(Status) (patented, pending, abandoned)
(Application Serial No.)	(Filing Date)	(Status) (patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. *(list name and registration number)*

Brian M. Kolkowski, Reg. No. 36,847

Send Correspondence to: Brian M. Kolkowski, Esq.
Cleveland Medical Devices, Inc.
4415 Euclid Ave, Suite 400
Cleveland, Ohio 44103

Direct Telephone Calls to: *(name and telephone number)*
Brian M. Kolkowski, (216) 649-0376

Full name of sole or first inventor	Hani Kayyali
Sole or first inventor's signature	Date 10/31/05
Residence	Shaker Heights, OH, USA
Citizenship	United States
Post Office Address	3066 Woodbury Road
	Shaker Heights, OH 44120

Full name of second inventor, if any	Robert Schmidt
Second inventor's signature	Date Oct 31, 2005
Residence	Cleveland, OH, USA
Citizenship	United States
Post Office Address	1721 Fulton Road
	Cleveland, OH 44113

Full name of third inventor, if any
Mohammad Modarres-Zadeh

Third inventor's signature
M. S M. Mz

Date
10/31/05

Residence
Cleveland Heights, OH, USA

Citizenship
United States

Post Office Address
3081 Chelsea Drive

Cleveland Heights, OH 44113

Full name of fourth inventor, if any
Brian Kolkowski

Fourth inventor's signature

Date
10/31/05

Residence
Leroy, OH, USA

Citizenship
United States

Post Office Address
6340 Taylor Road

Leroy, OH 44077

Full name of fifth inventor, if any

Fifth inventor's signature

Date

Residence

Citizenship

Post Office Address

Full name of sixth inventor, if any

Sixth inventor's signature

Date

Residence

Citizenship

Post Office Address

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	Devices and Methods for Sleep Disorder Diagnosis and Treatment
First Named Inventor/Applicant Name:	Hani Kayyali
Filer:	Brian M. Kolkowski/Mark Pennington
Attorney Docket Number:	CMD-105

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
UTILITY FILING FEE (ELECTRONIC FILING)	4011	1	75	75
UTILITY SEARCH FEE	2111	1	330	330
UTILITY EXAMINATION FEE	2311	1	380	380
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**785**

Electronic Acknowledgement Receipt

EFS ID:	33406503
Application Number:	16057963
International Application Number:	
Confirmation Number:	1595
Title of Invention:	Devices and Methods for Sleep Disorder Diagnosis and Treatment
First Named Inventor/Applicant Name:	Hani Kayyali
Customer Number:	81177
Filer:	Brian M. Kolkowski/Mark Pennington
Filer Authorized By:	Brian M. Kolkowski
Attorney Docket Number:	CMD-105
Receipt Date:	08-AUG-2018
Filing Date:	
Time Stamp:	11:14:17
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		CMD-105_2018-08-08_ContinuationSpecification.pdf	356776 01b29fe4b29d4761defaa7244c222ad584a27009	yes	45

	Multipart Description/PDF files in .zip description			
	Document Description	**Start**	**End**	
	Specification	1	41	
	Claims	42	44	
	Abstract	45	45	

Warnings:					
Information:					
2	Drawings-only black and white line drawings	CMD-105_2018-08-08_ContinuationDrawings.pdf	1623525 ef463078d57b77a102d3672cc02241493d16e56a	no	6
Warnings:					
Information:					
3	Application Data Sheet	CMD-105_2018-08-08_ADS.pdf	1823350 6a0c4925c372445c602f7036914a3d834980d1fe	no	9
Warnings:					
Information:					
4	Oath or Declaration filed	CMD-105_2018-08-08_parent-DecPwrAtty.pdf	2852829 825635149dec3678eb5b80c45303dbd33e706fce	no	4
Warnings:					
Information:					
5	Fee Worksheet (SB06)	fee-info.pdf	35359 3ce3f9bd59d9f7936bacc4deeb5eb759f9479492	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	6691839		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronic Patent Application Fee Transmittal

Application Number:	16057963
Filing Date:	
Title of Invention:	Devices and Methods for Sleep Disorder Diagnosis and Treatment
First Named Inventor/Applicant Name:	Hani Kayyali
Filer:	Brian M. Kolkowski/Mark Pennington
Attorney Docket Number:	CMD-105

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
UTILITY FILING FEE (ELECTRONIC FILING)	4011	1	75	75
UTILITY SEARCH FEE	2111	1	330	330
UTILITY EXAMINATION FEE	2311	1	380	380
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**785**

Electronic Acknowledgement Receipt

EFS ID:	33417492
Application Number:	16057963
International Application Number:	
Confirmation Number:	1595
Title of Invention:	Devices and Methods for Sleep Disorder Diagnosis and Treatment
First Named Inventor/Applicant Name:	Hani Kayyali
Customer Number:	81177
Filer:	Brian M. Kolkowski/Mark Pennington
Filer Authorized By:	Brian M. Kolkowski
Attorney Docket Number:	CMD-105
Receipt Date:	09-AUG-2018
Filing Date:	
Time Stamp:	07:25:07
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$785
RAM confirmation Number	080918INTEFSW07261300
Deposit Account	502704
Authorized User	Mark Pennington

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Fee Worksheet (SB06)	fee-info.pdf	35711 bd63031575b4ac57a24fa4879611ab3f34c9e015	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	35711		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Document code: WFEE

United States Patent and Trademark Office
Sales Receipt for Accounting Date: 08/29/2018

VVAN11 SALE #00000013 Mailroom Dt: 08/09/2018 502704 16057963
01 FC : 2051 80.00 DA

Document code: WFEE

United States Patent and Trademark Office
Sales Receipt for Accounting Date: 08/29/2018

VVAN11 SALE #00000013 Mailroom Dt: 08/09/2018 502704 16057963
01 FC : 2051 80.00 DA

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
16/057,963	08/08/2018	3735	865	CMD-105	20	3

CONFIRMATION NO. 1595

81177
Cleveland Medical Devices Inc.
4415 Euclid Ave. Ste. 500
Cleveland, OH 44103

FILING RECEIPT

OC000000101987527

Date Mailed: 08/30/2018

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Hani Kayyali, Shaker Heights, OH;
Robert Schmidt, Ft. Myers, FL;
Mohammad Modarres-Zadeh, Tampa, FL;
Brian Kolkowski, Leroy, OH;

Applicant(s)

Hani Kayyali, Shaker Heights, OH;
Robert Schmidt, Ft. Myers, FL;
Mohammad Modarres-Zadeh, Tampa, FL;
Brian Kolkowski, Leroy, OH;

Assignment For Published Patent Application

Cleveland Medical Devices Inc., Cleveland, OH

Power of Attorney:
Brian Kolkowski--36847

Domestic Priority data as claimed by applicant

This application is a CON of 13/440,116 04/05/2012 PAT 10076269
which is a CON of 11/266,899 11/04/2005 PAT 8172766

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 08/29/2018
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 16/057,963**
Projected Publication Date: Request for Non-Publication Acknowledged
Non-Publication Request: Yes
Early Publication Request: No
**** SMALL ENTITY ****
Title

Devices and Methods for Sleep Disorder Diagnosis and Treatment

Preliminary Class

600

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative,

this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop

technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 16/057,963

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	75		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	330		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	380		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	20 minus 20 =	*	x 50 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*	x 230 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	785		TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
16/057,963	08/08/2018	Hani Kayyali	CMD-105

CONFIRMATION NO. 1595

81177
Cleveland Medical Devices Inc.
4415 Euclid Ave. Ste. 500
Cleveland, OH 44103

INFORMAL NOTICE

OC000000101967528

Date Mailed: 08/30/2018

INFORMATIONAL NOTICE TO APPLICANT

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

The item(s) indicated below are also required and should be submitted with any reply to this notice to avoid further processing delays.

A new inventor's oath or declaration that identifies this application (e.g., by Application Number and filing date) is required. The inventor's oath or declaration does not comply with 37 CFR 1.63 in that it:

- does not state that the above-identified application was made or authorized to be made by the person executing the oath or declaration.

  Hani Kayyali
  Robert Schmidt
  Mohammad Modarres-Zadeh
  Brian Kolkowski

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/slee/

PTO/AIA/01 (06-12)
Approved for use through 11/30/2020. OMB 0651-0032
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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	Devices and methods for sleep disorder diagnosis and treatment

As the below named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application, or

☒ United States application or PCT international application number 16/057,963

filed on August 8, 2018.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: Hani Kayyali Date (Optional): 10/3/18

Signature: HC Kayyali

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PTO/AIA/01 (06-12)
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LEGAL NAME OF INVENTOR

Inventor: Robert Schmidt Date (Optional): _____

Signature: _____

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

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LEGAL NAME OF INVENTOR

Inventor: Mohammad Modarres-Zadeh Date (Optional): 09/18/2018

Signature: M. Modarres

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LEGAL NAME OF INVENTOR

Inventor: Brian Kolkowski Date (Optional): 10/2/18

Signature: 

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Electronic Acknowledgement Receipt

EFS ID:	33901458
Application Number:	16057963
International Application Number:	
Confirmation Number:	1595
Title of Invention:	Devices and Methods for Sleep Disorder Diagnosis and Treatment
First Named Inventor/Applicant Name:	Hani Kayyali
Customer Number:	81177
Filer:	Brian M. Kolkowski/Mark Pennington
Filer Authorized By:	Brian M. Kolkowski
Attorney Docket Number:	CMD-105
Receipt Date:	03-OCT-2018
Filing Date:	08-AUG-2018
Time Stamp:	08:21:37
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Oath or Declaration filed	CMD-105_2018-10-03_declarations.pdf	202737 76c8def83289875f4efe677ae49d72972aa148af	no	4

Warnings:

Information:	
Total Files Size (in bytes):	202737

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/057,963	08/08/2018	Hani Kayyali	CMD-105	1595

81177 7590 02/16/2021

Cleveland Medical Devices Inc.
4415 Euclid Ave. Ste. 500
Cleveland, OH 44103

EXAMINER	
NATNITHITHADHA, NAVIN	

ART UNIT	PAPER NUMBER
3791	

MAIL DATE	DELIVERY MODE
02/16/2021	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 16/057,963	Applicant(s) Kayyali et al.	
	Examiner NAVIN NATNITHITHADHA	Art Unit 3791	AIA (FITF) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 03 October 2018.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL.** 2b) ☑ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1-20 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1-20 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☑ The drawing(s) filed on 08 August 2018 is/are: a)☑ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application is being examined under the pre-AIA first to invent provisions.

Claim Objections

2. Claim 2 is objected to because of the following informalities: "the first device" is a typographical error, and should be amended to "the second ~~first~~ device" since it is the second device is defined as performing the recited function in claim 1. Appropriate correction is required.

3. Claim 3 is objected to because of the following informalities: "adjusted automatically adjusted" in lines 1-2 is a typographical/grammatical error, and should be amended to "~~adjusted~~ automatically adjusted". Appropriate correction is required.

4. Claim 8 is objected to because of the following informalities: "the CPAP device for physically or chemically treating a subject's sleeping disorder" lacks proper antecedent basis to claim 7, and should be amended to "the CPAP device for ~~physically or chemically~~ treating the [[a]]subject's sleep apnea ~~sleeping disorder~~" in order to provide proper antecedent basis. Appropriate correction is required.

5. Claim 10 is objected to because of the following informalities: "the subject's sleeping disorder or symptoms" lacks proper antecedent basis to claim 7, and should be amended to "the subject's sleep apnea ~~sleeping disorder or symptoms~~" in order to provide proper antecedent basis. Appropriate correction is required.

6. Claim 14 is objected to because of the following informalities: "a first device for diagnosing comprising at least two EEG sensors, and creating an output of a level of

severity of a subject's sleep apnea; and" in lines 2-3 lacks clarity as to whether the term "comprising" further limits the term "diagnosing" or the term "first device", and should be amended to "a first device for diagnosing and creating an output of a level of severity of a subject's sleep apnea, the first device comprising at least two EEG sensors~~, and creating an output of a level of severity of a subject's sleep apnea~~; and". Appropriate correction is required.

7. Claim 15 is objected to because of the following informalities: "the second device for physically or chemically treating a subject's sleeping disorder" lacks proper antecedent basis to claim 14, and should be amended to "the CPAP ~~second~~ device for ~~physically or chemically~~ treating the [[a]]subject's sleep apnea ~~sleeping disorder~~" in order to provide proper antecedent basis. Appropriate correction is required.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of pre-AIA 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. **Claims 1-13 are rejected under pre-AIA 35 U.S.C. 102(e) as being anticipated by Farrell et al., U.S. Patent Application Publication No. 2007/0161913 A1 ("Farrell")**.

As to Claim 1, Farrell teaches the following:

A sleeping disorder treatment system ("pressure delivery device", not labeled) (see fig. 1) comprising

a first device ("microprocessor") 16 for diagnosing and creating a quantitative output of a level of severity of a subject's sleeping disorder or symptoms (see "Preferably, the device provides ***efficacy tracking by detecting and recording or scoring SDB events or related information or indices over time, for example, by tracking or detecting central apneas, obstructive apneas, hypopneas, partial obstructions (e.g., flow flattening) or snoring***. This is illustrated in step 44 of FIG. 2. Similarly, pressure and/or flow versus time data may also be recorded for analysis. In so doing, the device preferably performs compliance tracking in which the time on and time off of the mask are recorded with SDB related events for evaluation by statistical summaries and charting. Methods for detecting and recording such information are known in the art, and may be implemented as described in U.S. Pat. No. 5,704,345." in para. [0036]; and see "For example, the device may record AHI (apnea hypopnea index) over time or during particular time periods such as session-by-session, day-by-day, hour-by-hour, etc. In one embodiment of the invention ***an AHI scoring scheme may be implemented as follows: [0038] (i) An apnea is scored if a 2 second moving average ventilation drops below 25% of a recent average ventilation (time constant=100s) for at least 10 consecutive seconds, [0039] (ii) An hypopnea is scored if the 8***

second moving average drops below 50% but not more than 25% of the recent average ventilation for 10 consecutive seconds. Similarly, the device may determine an index comparing central apneas versus obstructive apneas as disclosed in U.S. Pat. No. 6,832,609, the entire disclosure of which is incorporated by reference herein." in para. [0036]); and

a second device ("controller") 15 for physically or chemically treating a subject's sleeping disorder or symptoms, which can be adjusted using in part the output of the level of severity of the subject's sleeping disorder (see "A controller 15 or processor is configured and adapted to implement the methodology described in more detail herein and may include integrated chips, a memory and/or other instruction or data storage medium. … ***With such a controller, the apparatus can be used for many different pressure treatment therapies simply by adjusting the pressure delivery equation that is used to set the speed of the blower or to manipulate the venting with the release valve***." in para. [0025]; and see "Optionally, ***the therapeutic pressure levels of the above protocols*** may be preset by a clinician or ***may be automatically adjusted or set by automatic detection of SDB related events, such as apneas (obstructive or central), hypopneas, partial obstruction, snoring, etc. as disclosed in U.S. Pat. 5,704,345 (Berthon-Jones)***. For example, ***the IPAP or EPAP levels may be adjusted by the automated determination to hunt for a minimal pressure that will be required to prevent or***

alleviate obstruction. Other alternative methods to vary the therapeutic level of the pressure for treatment to a patient and to detect SDB events may be utilized and are known in the art." in para. [0032]).

As to Claim 2, Farrell teaches the following:

wherein the [second] device 16 for physically or chemically treating a subject's sleeping disorder is adjusted in real time (see "The AUTOSET T.TM. device ***continuously*** monitors the state of the patient's airway and determines an appropriate pressure to treat the patient, increasing it or decreasing it ***as necessary***." in para. [0005]).

As to Claim 3, Farrell teaches the following:

wherein the second device 15 is adjusted automatically adjusted by using data or a signal from the first device 16 (see "The AUTOSET T.TM. device ***continuously*** monitors the state of the patient's airway and ***determines an appropriate pressure to treat the patient, increasing it or decreasing it as necessary***." in para. [0005]).

As to Claim 4, Farrell teaches the following:

wherein the quantitative output of the level of severity of the subject's sleeping disorder or symptoms is based in part on a physiological signal of the subject (see "Preferably, the device provides efficacy tracking by detecting and recording or scoring SDB events or related information or indices over time, for example, by tracking or detecting central apneas, obstructive apneas, hypopneas, partial obstructions

(e.g., flow flattening) or snoring. This is illustrated in step 44 of FIG. 2. Similarly, pressure and/or flow versus time data may also be recorded for analysis. In so doing, the device preferably performs compliance tracking in which the time on and time off of the mask are recorded with SDB related events for evaluation by statistical summaries and charting. Methods for detecting and recording such information are known in the art, and may be implemented as described in U.S. Pat. No. 5,704,345." para. [0036]; and see "For example, the device may record AHI (apnea hypopnea index) over time or during particular time periods such as session-by-session, day-by-day, hour-by-hour, etc. In one embodiment of the invention an AHI scoring scheme may be implemented as follows: [0038] (i) An apnea is scored if a 2 second moving average ventilation drops below 25% of a recent average ventilation (time constant=100s) for at least 10 consecutive seconds, [0039] (ii) An hypopnea is scored if the 8 second moving average drops below 50% but not more than 25% of the recent average ventilation for 10 consecutive seconds." in para. [0037]).

As to Claim 5, Farrell teaches the following:

wherein the physiological signal is a brain wave signal (see "For example, a diagnosis unit may optionally include a pulse oximeter 20, respiratory movement sensors 22 such as a chest band, ***EEG*** & ECG

24, EOG 25 and/or electrodes 28 for detecting cardiac rhythm." in para. [0026]).

As to Claim 6, Farrell teaches the following:

wherein the physiological signal is an EKG signal (see "For example, a diagnosis unit may optionally include a pulse oximeter 20, respiratory movement sensors 22 such as a chest band, EEG & ***ECG*** 24, EOG 25 and/or electrodes 28 for detecting cardiac rhythm." in para. [0026]).

As to Claim 7, Farrell teaches the following:

A sleep apnea treatment system ("pressure delivery device", not labeled) (see fig. 1) comprising

a first device ("microprocessor") 16 for diagnosing and creating an output of a level of severity of a subject's sleep apnea (see "Preferably, the device provides ***efficacy tracking by detecting and recording or scoring SDB events or related information or indices over time, for example, by tracking or detecting central apneas, obstructive apneas, hypopneas, partial obstructions (e.g., flow flattening) or snoring***. This is illustrated in step 44 of FIG. 2. Similarly, pressure and/or flow versus time data may also be recorded for analysis. In so doing, the device preferably performs compliance tracking in which the time on and time off of the mask are recorded with SDB related events for evaluation by statistical summaries and charting. Methods for detecting and recording such

information are known in the art, and may be implemented as described in U.S. Pat. No. 5,704,345." in para. [0036]; and see "For example, the device may record AHI (apnea hypopnea index) over time or during particular time periods such as session-by-session, day-by-day, hour-by-hour, etc. In one embodiment of the invention ***an AHI scoring scheme may be implemented as follows: [0038] (i) An apnea is scored if a 2 second moving average ventilation drops below 25% of a recent average ventilation (time constant=100s) for at least 10 consecutive seconds, [0039] (ii) An hypopnea is scored if the 8 second moving average drops below 50% but not more than 25% of the recent average ventilation for 10 consecutive seconds***. Similarly, the device may determine an index comparing central apneas versus obstructive apneas as disclosed in U.S. Pat. No. 6,832,609, the entire disclosure of which is incorporated by reference herein." in para. [0036]); and

a CPAP device ("controller") 15 for treating the subject's sleep apnea, which can be adjusted using the output (see "A controller 15 or processor is configured and adapted to implement the methodology described in more detail herein and may include integrated chips, a memory and/or other instruction or data storage medium. … ***With such a controller, the apparatus can be used for many different pressure treatment therapies simply by adjusting the pressure delivery equation that is used to set the speed of the blower or***

to manipulate the venting with the release valve." in para. [0025]; and see "Optionally, ***the therapeutic pressure levels of the above protocols*** may be preset by a clinician or ***may be automatically adjusted or set by automatic detection of SDB related events, such as apneas (obstructive or central), hypopneas, partial obstruction, snoring, etc. as disclosed in U.S. Pat. 5,704,345 (Berthon-Jones)***. For example, ***the IPAP or EPAP levels may be adjusted by the automated determination to hunt for a minimal pressure that will be required to prevent or alleviate obstruction***. Other alternative methods to vary the therapeutic level of the pressure for treatment to a patient and to detect SDB events may be utilized and are known in the art." in para. [0032]).

As to Claim 8, Farrell teaches the following:

wherein the CPAP device 15 for physically or chemically treating a subject's sleeping disorder is adjusted in real time (see "The AUTOSET T.TM. device ***continuously*** monitors the state of the patient's airway and determines an appropriate pressure to treat the patient, increasing it or decreasing it ***as necessary***." in para. [0005]).

As to Claim 9, Farrell teaches the following:

wherein the CPAP device 15 is adjusted automatically using data or a signal from the first device 16 (see "The AUTOSET T.TM. device ***continuously*** monitors the state of the patient's airway and ***determines an appropriate***

pressure to treat the patient, increasing it or decreasing it as necessary." in para. [0005]).

As to Claim 10, Farrell teaches the following:

wherein the output of the level of severity of the subject's sleeping disorder or symptoms is based in part on a physiological signal of the subject (see "Preferably, the device provides efficacy tracking by detecting and recording or scoring SDB events or related information or indices over time, for example, by tracking or detecting central apneas, obstructive apneas, hypopneas, partial obstructions (e.g., flow flattening) or snoring. This is illustrated in step 44 of FIG. 2. Similarly, pressure and/or flow versus time data may also be recorded for analysis. In so doing, the device preferably performs compliance tracking in which the time on and time off of the mask are recorded with SDB related events for evaluation by statistical summaries and charting. Methods for detecting and recording such information are known in the art, and may be implemented as described in U.S. Pat. No. 5,704,345." para. [0036]; and see "For example, the device may record AHI (apnea hypopnea index) over time or during particular time periods such as session-by-session, day-by-day, hour-by-hour, etc. In one embodiment of the invention an AHI scoring scheme may be implemented as follows: [0038] (i) An apnea is scored if a 2 second moving average ventilation drops below 25% of a recent average ventilation (time constant=100s) for at least 10

consecutive seconds, [0039] (ii) An hypopnea is scored if the 8 second moving average drops below 50% but not more than 25% of the recent average ventilation for 10 consecutive seconds." in para. [0037]).

As to Claim 11, Farrell teaches the following:

wherein the physiological signal is a brain wave signal (see "For example, a diagnosis unit may optionally include a pulse oximeter 20, respiratory movement sensors 22 such as a chest band, ***EEG*** & ECG 24, EOG 25 and/or electrodes 28 for detecting cardiac rhythm." in para. [0026]).

As to Claim 12, Farrell teaches the following:

wherein the physiological signal is an EKG signal (see "For example, a diagnosis unit may optionally include a pulse oximeter 20, respiratory movement sensors 22 such as a chest band, EEG & ***ECG*** 24, EOG 25 and/or electrodes 28 for detecting cardiac rhythm." in para. [0026]).

As to Claim 13, Farrell teaches the following:

wherein the first device 16 sends a wireless signal based in part on the output level of severity to the CPAP device 15 to adjust a treatment of the subject (such an configuration between the first device and the CPAP device is within the scope of Farrell's disclosure, see "***While this apparatus is generally described as a single unit, it is understood that a combination of devices and/or computers linked by any available communications method***

may be used to accomplish the goals of the invention. For example, the apparatus can interface with a variety of hand-held devices such as a Palm Pilot via wireless communication or it may interface with a network for transmission between the devices." in para. [0026]).

Claim Rejections - 35 USC § 103

10. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries for establishing a background for determining obviousness under pre-AIA 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.

3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. This application currently names joint inventors. In considering patentability of the claims under pre-AIA 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of pre-AIA 35 U.S.C. 103(c) and potential pre-AIA 35 U.S.C. 102(e), (f) or (g) prior art under pre-AIA 35 U.S.C. 103(a).

12. **Claims 14-17 and 20 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Farrell et al., U.S. Patent Application Publication No. 2007/0161913 A1 ("Farrell"), in view of Chervin et al., U.S. Patent No. 7,190,995 B2 ("Chervin").**

As to Claim 14, Farrell teaches the following:

A sleep apnea treatment system ("pressure delivery device", not labeled) (see fig. 1) comprising

a first device ("microprocessor") 16 for diagnosing comprising [an EEG sensor] ("EEG") 24 (see "For example, a diagnosis unit may optionally include a pulse oximeter 20, respiratory movement sensors 22 such as a chest band, ***EEG*** & ECG 24, EOG 25 and/or electrodes 28 for detecting cardiac rhythm." in para. [0026]), and creating an output of a level of severity of a subject's sleep apnea (see "Preferably, the device provides efficacy tracking by ***detecting and recording or scoring SDB events or related information or indices over time, for example, by tracking or detecting central apneas, obstructive apneas, hypopneas, partial obstructions (e.g., flow flattening) or snoring***. This is illustrated in step 44 of FIG. 2. Similarly, pressure and/or flow versus time data may also be recorded for analysis. In so doing, the device preferably performs compliance tracking in which the time on and time off of the mask are

recorded with SDB related events for evaluation by statistical summaries and charting. Methods for detecting and recording such information are known in the art, and may be implemented as described in U.S. Pat. No. 5,704,345." in para. [0036]; and see "For example, the device may record AHI (apnea hypopnea index) over time or during particular time periods such as session-by-session, day-by-day, hour-by-hour, etc. In one embodiment of the invention ***an AHI scoring scheme may be implemented as follows: [0038] (i) An apnea is scored if a 2 second moving average ventilation drops below 25% of a recent average ventilation (time constant=100s) for at least 10 consecutive seconds, [0039] (ii) An hypopnea is scored if the 8 second moving average drops below 50% but not more than 25% of the recent average ventilation for 10 consecutive seconds***. Similarly, the device may determine an index comparing central apneas versus obstructive apneas as disclosed in U.S. Pat. No. 6,832,609, the entire disclosure of which is incorporated by reference herein." in para. [0036]); and

a CPAP device ("controller") 15 for treating the subject's sleep apnea, which can be adjusted using the output (see "A controller 15 or processor is configured and adapted to implement the methodology described in more detail herein and may include integrated chips, a memory and/or other instruction or data storage medium. … ***With such a controller, the apparatus can be used for many different***

pressure treatment therapies simply by adjusting the pressure delivery equation that is used to set the speed of the blower or to manipulate the venting with the release valve." in para. [0025]; and see "Optionally, *the therapeutic pressure levels of the above protocols* may be preset by a clinician or *may be automatically adjusted or set by automatic detection of SDB related events, such as apneas (obstructive or central), hypopneas, partial obstruction, snoring, etc. as disclosed in U.S. Pat. 5,704,345 (Berthon-Jones)*. For example, *the IPAP or EPAP levels may be adjusted by the automated determination to hunt for a minimal pressure that will be required to prevent or alleviate obstruction*. Other alternative methods to vary the therapeutic level of the pressure for treatment to a patient and to detect SDB events may be utilized and are known in the art." in para. [0032]).

Farrell does not explicitly teach the following:

a first device ("microprocessor") 16 ... comprising ***at least two*** EEG sensors.

However, Chervin teaches the following:

a first device ("processor") 18 (see fig. 2) comprising at least two EEG sensors ("two to sixteen EEG electrodes 12") 12 (see "With reference to FIG. 2, a system 10 for determining RCREC according to the present invention is illustrated. Digital EEG data obtained via polysomnography for adults and children typically includes *two to sixteen EEG electrodes 12* or sensors (e.g., F3-A2, F4-A1, C3-

2, C4-A1, O1-A2, O2-A1 of the 10 20 international electrode placement system)." in col. 6, ll. 52-58; and see "***As is known in the art, during polysomnography a continuous stream of voltage data representative of an EEG signal is detected by the electrodes 12 affixed to the subject's scalp, and the EEG signal is sampled and digitized***. … ***The digital EEG signal and the respiratory signal are sent to a processor 18 which processes the signals*** as described in detail below, typically stores EEG data in memory 20, and can display EEG data on a display 22." in col. 7, ll. 1-16). Thus, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify Farrell's "EEG 24" to be "two to sixteen EEG electrodes", as taught by Chervin in order to properly detect sleep-disordered breathing ("SDB") events as suggested by Chervin (see Chervin, col. 1, ll. 27-43, and col. 2, l. 63, to col. 3, l. 20). Furthermore, Both Farrell and Chervin are in the same field of endeavor, i.e. SDB event detection and treatment (see Farrell, Abstract; and see Chervin, Abstract and col. 17, ll. 10-25).

As to Claim 15, Farrell teaches the following:

wherein the [CPAP] device 15 for physically or chemically treating a subject's sleeping disorder is adjusted in real time (see "The AUTOSET T.TM. device ***continuously*** monitors the state of the patient's airway and determines an appropriate pressure to treat the patient, increasing it or decreasing it ***as necessary***." in para. [0005]).

As to Claim 16, Farrell teaches the following:

wherein the CPAP device 15 is adjusted automatically using data or a signal from the first device 16 (see "The AUTOSET T.TM. device ***continuously*** monitors the state of the patient's airway and ***determines an appropriate pressure to treat the patient, increasing it or decreasing it as necessary***." in para. [0005]).

As to Claim 17, Farrell teaches the following:

wherein the first device 16 sends a wireless signal based in part on the output level of severity to the CPAP device15 to adjust a treatment of the subject (such an configuration between the first device and the CPAP device is within the scope of Farrell's disclosure, see "***While this apparatus is generally described as a single unit, it is understood that a combination of devices and/or computers linked by any available communications method may be used to accomplish the goals of the invention***. For example, the apparatus can interface with a variety of hand-held devices such as a Palm Pilot via wireless communication or it may interface with a network for transmission between the devices." in para. [0026]).

As to Claim 20, Farrell teaches the following:

wherein the CPAP device 15 is adjusted by a remote control device ("hand-held display and control devices") 12 (see "The apparatus preferably also includes a communication port or module 10, for example, a wireless communication transceiver and/or a network card, for ***communication with*** other devices or computers such as ***hand-held***

display and control devices 12." in para. [0026]; and see "For example, ***the apparatus can interface with a variety of hand-held devices such as a Palm Pilot via wireless communication*** or it may interface with a network for transmission between the devices. With such a device or system, a physician may, for example, remotely monitor, analyze or record the status or data history of a patient. … Furthermore, ***the treatment program that is being run on the patient can be monitored and changed remotely***." in para. [0028]).

13. **Claims 18 and 19 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Farrell et al., U.S. Patent Application Publication No. 2007/0161913 A1 ("Farrell"), in view of Chervin et al., U.S. Patent No. 7,190,995 B2 ("Chervin"), as applied to claim 14, and further in view of Tsukashima et al., U.S. Patent Application Publication No. 2004/0210153 A1 ("Tsukashima")**.

As to Claims 18 and 19, Farrell in view of Chervin teaches the subject matter of claim 14 above. Farrell in view of Chervin does not teach the following:

wherein the CPAP device further comprises a nebulizer; and

wherein the nebulizer is used to deliver medication.

However, Tsukashima teaches the following:

CPAP device ("CPAP device") 16 (see fig. 1) further comprises a nebulizer ("treatment nebulizer/atomizer/humidifier device") 32 (see "The treatment nebulizer/atomizer/humidifier device 32 is pneumatically connected to hose 18 at some point along its

length between the CPAP device 16 and the typical mask apparatus 36. The treatment nebulizer/atomizer/humidifier device 32 has a medicament storage chamber 33 where various types of therapeutic medicaments can be delivered to the pneumatic system and to the patient at intervals commanded by the processing receiver 26." in para. [0029]), wherein the nebulizer 32 is used to deliver medication (see "The medicament chamber 33 can contain liquid, gaseous or powdered therapeutics that the treatment nebulizer/atomizer/humidifier device 32 is designed to administer to the pneumatic system upon instructions from the processing receiver 26. It is contemplated that the medicament chamber 33 could include a plurality of medicaments in various compartments in the medicament chamber 33. It is also contemplated that ***treatment nebulizer/atomizer/humidifier device 32 can select to administer one or more, or in a combination, multiple medicaments stored in the medicament chamber 33***. Either a continuous method or, to conserve medicine, a pulsed method corresponding with each breath detected by conventional means can be employed by the present invention." in para. [0037])

Thus, it would have been obvious for one of ordinary skill in the art at the time the present application was effectively filed to modify Farrell's CPAP device to include Tsukashima's nebulizer ("treatment nebulizer/atomizer/humidifier device") 32 because both Farrell and Tsukashima are directed to CPAP devices and

the addition of a nebulizer would alleviate the following technical problems (see Tsukashima, para. [0007]-[0009]):

> [0007] …Sleep apnea has also been found to trigger reflux events. Testing for GER and the diagnosis of GERD are typically accomplished by measuring pH with catheter based devices.
> [0008] These current pH monitoring methods suffer from the following drawbacks: 1) the current method requires an invasive procedure to place a pH measurement catheter or implanted pH measurement capsule in the patient's esophagus, 2) the procedure is not well tolerated by some patients, 3) the catheter or capsule placement must be performed by a physician, 4) the capsule cannot be placed above the Upper Esophageal Sphincter (UES) to measure airway pH, and 5) there are no defined standards for evaluation of pH above the UES.
> [0009] Accordingly, there is a need in this art for a novel, pH diagnostic and monitoring system with electronic or wireless communication linked to a processing receiver that can also be used to activate a therapeutic nebulizer/atomizer/humidifier for treating asthmatic or other respiratory conditions.

Conclusion

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NAVIN NATNITHITHADHA whose telephone number is (571)272-4732. The examiner can normally be reached on Monday - Friday 6:00 am - 8:30 am & 10:30 am - 4:00 pm.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason M Sims can be reached on 571-272-7540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see https://ppair-my.uspto.gov/pair/PrivatePair. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/NAVIN NATNITHITHADHA/
Primary Examiner, Art Unit 3791
02/12/2021

Notice of References Cited	Application/Control No. 16/057,963	Applicant(s)/Patent Under Reexamination Kayyali et al.	
	Examiner NAVIN NATNITHITHADHA	Art Unit 3791	Page 1 of 4

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*	B	US-20100043795-A1	02-2010	UJHAZY; Anthony John	A61B5/746	128/204.23
*	C	US-20080276939-A1	11-2008	Tiedje; Mikael	A61M16/0051	128/204.23
*	D	US-20080257349-A1	10-2008	Hedner; Jan	A61B5/087	128/204.23
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*	J	US-20060084877-A1	04-2006	Ujhazy; Anthony John	A61M16/0069	600/483
*	K	US-20060042627-A1	03-2006	MacMillan; Nicholas J.	A61M16/00	128/204.22
*	L	US-20050268916-A1	12-2005	Mumford, John Robert	A61M16/0633	128/207.13
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*	C	US-20040254493-A1	12-2004	Chervin, Ronald D.	A61B5/374	600/544
*	D	US-20040210153-A1	10-2004	Tsukashima, Ross	A61M15/0003	600/532
*	E	US-20040163648-A1	08-2004	Burton, David	A61M16/0605	128/204.21
*	F	US-20040138576-A1	07-2004	Wright, Jonathan Caldwell	A61M16/0069	600/533
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*	H	US-10543328-B1	01-2020	Kayyali; Hani	A61M16/12	1/1
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A61B5/085 or A61M16/026 or A61M16/0069 or A61B5/02055 or A61B5/4815 or A61M16/0051 or A61M2205/3553 or A61M2205/3561 or A61M2205/3584 or A61M2205/3592 or A61M2016/0027 or A61M2016/0039 or A61M2202/0208 or A61M2230/04 or A61M2230/10 or A61M2230/14 or A61M2230/202 or A61M2230/205 or A61M2230/60	02/11/2021	/NN/

CPC Combination Sets - Searched*		
Symbol	**Date**	**Examiner**

US Classification - Searched*			
Class	**Subclass**	**Date**	**Examiner**
600	484,529-543	02/11/2021	/NN/

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	**Date**	**Examiner**
EAST (attached): USPAT, US-PGPUB, EPO, JPO, Derwent, Keyword, Forward/Backward Citation, Assignee, Inventor, USPC, CPC searches	02/11/2021	/NN/

/N.N/ Primary Examiner, Art Unit 3791	

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/057,963	Kayyali et al.
	Examiner	Art Unit
	NAVIN NATNITHITHADHA	3791

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
	A61B5/085 or A61M16/026 or A61M16/0069 or A61B5/02055 or A61B5/4815 or A61M16/0051 or A61M2205/3553 or A61M2205/3561 or A61M2205/3584 or A61M2205/3592 or A61M2016/0027 or A61M2016/0039 or A61M2202/0208 or A61M2230/04 or A61M2230/10 or A61M2230/14 or A61M2230/202 or A61M2230/205 or A61M2230/60		/NN/

/N.N/ Primary Examiner, Art Unit 3791	

ResMed Corp. - Ex. 1002
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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
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L13	1	L11 AND (continuous$3)	US-PGPUB; USPAT; USOCR	OR	ON	2021/02/12 13:45
L14	1	L11 AND (ECG OR EKG OR electrocardiograph$5) AND (EEG OR electroencephalograph$5)	US-PGPUB; USPAT; USOCR	OR	ON	2021/02/12 13:59
L15	1	L11 AND (ECG OR EKG OR electrocardiograph$5) AND (EEG OR electroencephalograph$5 OR brain)	US-PGPUB; USPAT; USOCR	OR	ON	2021/02/12 14:00
L16	1	L11 AND (ECG OR EKG OR electrocardiograph$5) AND (EEG OR electroencephalograph$5 OR brain OR brainwave$5)	US-PGPUB; USPAT; USOCR	OR	ON	2021/02/12 14:01
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L18	0	L11 AND (nebuliz$4)	US-PGPUB; USPAT; USOCR	OR	ON	2021/02/12 14:59
L19	0	L11 AND (medication)	US-PGPUB; USPAT; USOCR	OR	ON	2021/02/12 14:59

L20	1	L11 AND (medication OR medicine OR drug OR dosage)	US-PGPUB; USPAT; USOCR	OR	ON	2021/02/12 14:59
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L30	13	L9 AND (nebuliz$5 SAME (medication OR medicine OR drug OR dosage))	US-PGPUB; USPAT; USOCR	OR	ON	2021/02/12 15:30
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2/12/2021 3:45:14 PM
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re:	Application of Kayyali et al.	)	
Serial No.:	16/057,963	)	Art Unit: 3791
Filed:	August 8, 2018	)	
For:	Devices and Methods for Sleep Disorder Diagnosis and Treatment	)	Attorney Docket No.: CMD-105
Examiner:	Navin Natnithithadha	)	

May 17, 2021

AMENDMENT

Commissioner of Patents and Trademarks
Alexandria, VA 22313-1450

This amendment is being filed in response to an Office Action dated February 16, 2021 with a due date of response of May 17, 2021, 2021. The Applicants believe no extension of time is needed but if this is not the case the Applicant contingently petition for an extension of time and authorize the USPTO to deduct any fees from their deposit account 502704. The following amendments to the specification and claims are respectfully submitted.

Electronic Acknowledgement Receipt

EFS ID:	42733555
Application Number:	16057963
International Application Number:	
Confirmation Number:	1595
Title of Invention:	Devices and Methods for Sleep Disorder Diagnosis and Treatment
First Named Inventor/Applicant Name:	Hani Kayyali
Customer Number:	81177
Filer:	Brian M. Kolkowski/Mark Pennington
Filer Authorized By:	Brian M. Kolkowski
Attorney Docket Number:	CMD-105
Receipt Date:	17-MAY-2021
Filing Date:	08-AUG-2018
Time Stamp:	09:10:44
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		CMD-105_17May2021_amendment.pdf	238222 9b5e79c5ccb868c614990ab9b5091234b2c07d5c9	yes	15

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Applicant Arguments/Remarks Made in an Amendment	7	15
	Claims	2	6
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
Warnings:			
Information:			
	Total Files Size (in bytes):	238222	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

REMARKS

Claims 1-20 were rejected in the Office Action issued February 16, 2021. The Applicants have amended claims 1-6, 8-13 and 15-20, cancelled claims 7 and 14, and added new claims 21 and 22. The Applicants respectfully traverse the Examiner's objections and rejections for the reasons set forth below.

Claim Objections

Claims 2, 3, 8, 10, 14 and 15 were objected to due to an informalities. The Applicants thank the Examiner for his helpful comments and submit the claims as amended now overcomes these objections.

Anticipation under 35 U.S.C. § 102

To provide legal context as well as an analytical framework for the Applicants' remarks, the Applicants wish, as an initial point, to respectfully remind the Examiner that a proper finding of anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration. *W.L. Gore & Associates v. Garlock*, 721 F.2d 1540, 202 USPTO 202 (Fed Cir. 1983). It is not enough that the prior art reference disclose all of the claimed elements in isolation, but rather anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim. *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 221 USPQ 481 (Fed. Cir. 1984). Further, anticipation requires that the prior art reference must be enabling, thus placing the allegedly disclosed matter in the possession of the public. *Akzo N.V. v. U.S. Int'l Trade Comm'n*, 808 F.2d 1471, 1 USPQ 2d. 1241 (Fed Cir. 1986). The standard of anticipation is identity of invention. *Glaverbel Societe Anonyme v. Northlake Mktg. & Supply, Inc.*, 45 F.3d 1550, 33 U.S.P.Q.2d 1496, 1500 (Fed.Cir.1995). Identity of invention is a question of fact that requires a showing that each element of the claim in issue is found in a prior patent or publication, either expressly or inherently. *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 771, 218 USPQ 781, 789 (Fed.Cir.1983), cert. denied, 465 U.S. 1026, 104 S.Ct. 1284, 79 L.Ed.2d 687 (1984). Inherency may not be established by probabilities or possibilities.

Continental Can Co. v. Monsanto Co., 948 F.2d 1264, 1269 (Fed. Cir. 1991). Before burden is shifted to the applicant to disprove inherency, the examiner is required provide evidence or scientific reasoning to establish the reasonableness of the examiner's belief that a functional limitation is an inherent characteristic of the prior art. *Ex parte Skinner*, 2 USPQ 2d 1788, 1789 (BPAI 1986).

Thus, to reach a proper finding of anticipation, the examiner must show that each and every claim limitation is present in a single prior art reference (the identity of invention requirement) and that the same prior art reference enables the claimed invention so as to place the invention in the possession of a person having ordinary skill in the art (the anticipatory enablement requirement). If the examiner falls short in meeting any of these requirements then the examiner has failed to establish a *prima facie* case and the Applicants are entitled to the patent. *See In re Glaug*, 283 F.3d 1335 at 1338 (Fed. Cir. 2002) ("If the PTO fails to meet this burden [to establish a *prima facie* case], then the applicant is entitled to the patent"). Further, refusal by the USPTO to issue the patent in the face of an examiner's failure to properly establish a *prima facie* case of anticipation or some other proper grounds for rejection places the examiner and the USPTO in contravention of 35 U.S.C. § 131, which dictates that if after examination of an application "it appears that the applicant is entitled to a patent under the law, the Director shall issue a patent therefor" (emphasis added).

Claims 1-13 were rejected under pre-AIA 35 USC 102(e) as being anticipated by Farrell et al., U.S. Pat. Appln 2007/0161913 ("Farrell"). The Applicants traverse the rejection and submit the claims as amended are not anticipated by Farrell.

With respect to Claims 1-13, Farrell does not teach or disclose a positive airway pressure (PAP) sleeping disorder treatment system comprising a PAP device; a software adapted to be used on a base station, cell phone or PDA each comprising a first radio frequency wireless transceiver, a processor, the software, and a display, the software further adapted for receiving data, in whole or part, related to treatment and its efficacy generated by the PAP device and to output the data, in whole or in part, for viewing on the display by the subject; and a remote internet site; wherein the PAP device is for physically or chemically treating a subject's sleeping disorder or symptoms, and

further comprises: a blower having an air output, an airflow sensor internal to the PAP device adapted for measuring the respiratory airflow of a subject while using the PAP, a processor adapted for generating the data related to treatment and its efficacy by receiving sensor data from the airflow sensor, and calculating both symptom data of a severity and/or an index of a subject's symptoms measured during use of the PAP device and data of usage of the PAP device, a second radio frequency wireless transceiver, and a mask or a nasal cannula; and the remote internet site is adapted to receive the data related to treatment, in whole or part, generated by the PAP device and transmitted via the second radio frequency wireless transceiver as claimed, and more particularly of calculating both symptom data of a severity and/or an index of a subject's symptoms measured during use of the PAP device and data of usage of the PAP device as further claimed. Furthermore Farrell does not teach or disclose the of software adapted for a base station, cellular phone or PDA that allows some form of the subject's treatment data to be displayed and viewed by the subject nor a remote internet site that allows this treatment data to be collected and reviewed for analysis, and to make therapeutic changes.

Instead Farrell discloses a complex system that is used to examine "changes in the patient's heart rate associated with changes in sleep disordered breathing. The events in Farrell are detected using a tethered patient interface box through which all of the sensors are connected both which are external to the enclosure of the PAP device.

With respect to Claim 2, Farrell does not teach or disclose the system in Claim 1 wherein the PAP device for physically or chemically treating a subject's sleeping disorder is adjusted in real time based on data related to treatment generated by the PAP device and received by the remote internet site as claimed. There is no indication in Farrell that the PAP device is configured similarly to the claimed invention's PAP device and of a remote internet site where data related to treatment and its efficacy generated by the PAP device is transmitted in order to adjust the PAP device in real time.

With respect to Claim 3, Farrell does not teach or disclose the system in Claims 1 and 2, wherein the PAP device is adjusted automatically with a signal from the remote internet site based on data related to treatment and its efficacy received as claimed. The

Examiner misreads paragraph [005] in that the PAP itself is making this adjustment based on other factors.

With respect to Claim 4, Farrell does not teach or disclose the system in Claim 1 wherein the the software adapted for use on the computer, cell phone or PDA receives, in whole or part, the data related to treatment and its efficacy generated by the PAP device and is used to retransmit the data related to treatment and its efficacy received by the software through the first radio frequency wireless transceiver, in whole or part, to the remote internet site as claimed.

With respect to Claim 5, Farrell does not teach or disclose the system in Claim 1, wherein the software adapted for use on the computer, cell phone or PDA receives, in whole or part, the data related to treatment generated by the PAP device that is received then retransmitted from the remote internet site as claimed.

With respect to Claim 6, Farrell does not teach or disclose the system in Claim 1, wherein the both the software adapted for use on the computer, cell phone or PDA and the remote internet site independently receive, in whole or part, the data related to treatment and its efficacy generated by the PAP device as claimed.

With respect to Claims 8 and 9, Farrell does not teach or disclose the system in Claims 1 and further in 4 and 6, wherein the second radio frequency wireless transceiver of the PAP device and the software adapted to use the first radio frequency wireless transceiver of the base station, cellular phone or PDA to transmit data related to treatment and its efficacy use Bluetooth wireless protocol to communicate as claimed.

With respect to Claim 10, Farrell does not teach or disclose the system in Claims 1 and 5, wherein the PAP device and the remote internet site as well as the remote internet site and the software adapted for the base station, cellular phone or PDA transmit data related to treatment via cell towers or cable.

With respect to Claims 11, 12 and 13, Farrell does not teach or disclose the system in Claims 1 and further in 4, 5, and 6 wherein the index of the subject's symptoms is a respiratory disturbance index where such index is calculated using a signal from an airflow sensor on the PAP by a processor on the PAP as claimed.

Claim 1 has been modified and amended to be similar to previously allow Claim 15 in its direct parent case Appln Ser. No. 13/440,116, which issued as U.S. Pat. No. 10,076,269. The closest prior art in that case was Bowen and Wright and the Applicants believe the arguments made in the parent case and more apply here. Claims 4-6, 8-13, and 15-22 were patterned after Claims 16-20 in the patent case and again the Applicants believe the closest prior art was again Bowen and Wright and the Applicants believe those same arguments apply here. The main difference between the claim allowed in the parent case and that currently being prosecuted in the instant case is that we are claiming the software instead of the base station, cellular phone or PDA, but the software is subject to being used with a base station, cellular phone or PDA, which has all the limitations of those claimed in the parent case. The same data is being transferred as in the parent case but refer to it as "data related to the subject's treatment and its efficacy" for display to the subject and their care providers. If it would help the Examiner, the Applicants would be open to an interview to explain in greater detail if this is not apparent.

The Applicants understand even though the amended Claims are not identical to Claims 15-20 in the parent case that it is likely the Examiner will want a terminal disclaimer to be filed in this case to overcome an obviousness type double patenting rejection. The Applicants will be willing to file such a terminal disclaimer once there is agreement that no other rejection or objection is proper.

Given the above evidence, the Applicants urge the Examiner to withdraw this rejection.

Obviousness under 35 U.S.C. § 103

To provide legal context as well as an analytical framework for the remarks that follow, the Applicant wishes at the outset to respectfully point out that obviousness under 35 U.S.C. § 103(a) is a question of law based on underlying findings of fact, and that the Examiner bears the initial burden of factually supporting any conclusion of obviousness by establishing a *prima facie* case based on the facts. *See* MPEP 2142. Additionally, if the Examiner does not produce a *prima facie* case, the Applicant is under no obligation to submit evidence of nonobviousness. *Id.* To provide the proper factual support for an assertion of *prima facie* obviousness the Examiner must perform the factual inquiries set

forth in *Graham v. John Deere Co.*, 383 U.S. 1, (1966). These factual inquiries include (1) determining the scope and content of the prior art, (2) ascertaining the differences between the claimed invention and the prior art, and (3) determining the level of ordinary skill in the art at the time of the claimed invention. *Graham* also indicates that "secondary considerations" such as commercial success, long-felt but unsolved needs, failure of others and unexpected results may be considered in determining obviousness. Importantly, "the *Graham* factors, including secondary considerations when present, are the controlling inquiries in any obviousness analysis." MPEP 2141(II) (emphasis added).

Against this backdrop it becomes clear that if the Examiner errs in performing any of the *Graham* factual inquiries, the Examiner cannot be deemed to have established a *prima facie* case of obviousness since such a conclusion would be unsupported by the factual foundation required by *Graham*. Examples of the Examiner committing error in performing the *Graham* factual inquiries include, among other things, failure to appreciate the differences between the claimed invention and the prior art (leading to a flawed conclusion under the second *Graham* factor), as well as a failure to determine the level of ordinary skill in the art (resulting in failure based on the third *Graham* factor).

With specific regard to the Examiner's obligation under the third *Graham* factor to determine the level of ordinary skill in the art at the time of the claimed invention, the Applicant would direct particular attention to the requirement that "[a]ny obviousness rejection should include, either explicitly or implicitly in view of the prior art applied, an indication of the level of ordinary skill." *See* MPEP 2141(II)(C) (emphasis added).

In addition, it is important to recognize that merely setting forth what the Examiner believes the level of ordinary skill should be or merely making the blanket assertion that the level of ordinary skill in the pertinent art is set forth in the references is insufficient to meet the Examiner's burden under the third *Graham* factor and 35 U.S.C. § 103(a) if the Examiner is relying on a combination of references to demonstrate obviousness. This is because in addition to providing an "indication of the level of ordinary skill," *MPEP 2141(II)(C)*, the Examiner must also provide an explanation of how and why the person of ordinary skill in the art at the time of the invention would have deemed it obvious to select and combine various references relied upon by the Examiner in such a way as to render the claimed invention obvious. *See In re*

Vaidyanathan, Appeal No. 2009-1404, Fed. Cir., May 19, 2010 (nonprecedential) (faulting both the BPAI and Examiner for failing to provide "any evidentiary support or reasoning for why a person of ordinary skill in the field of the invention would have deemed it obvious to select and combine various steps from different references, in the manner of the applicant" and further noting that *KSR International Co. v. Teleflex Inc., 550 U.S. 398 (2007)* "did not remove the need to anchor the analysis [of obviousness] in explanation of how a person of ordinary skill would select and apply the teachings of the references").

Thus, in order for the Examiner to properly establish a *prima facie* case of obviousness the Examiner must first make the factual inquiries required by *Graham* and, if relying on a combination of references, must further provide some motivation to combine the references from the perspective of one of ordinary skill in the art. If the Examiner falls short in meeting any of these requirements then the Examiner has failed to establish a *prima facie* case and the applicant is entitled to the patent. *See In re Glaug*, 283 F.3d 1335 at 1338 (Fed. Cir. 2002) ("If the PTO fails to meet this burden [to establish a *prima facie* case], then the applicant is entitled to the patent"). As stated in the United States Patent and Trademark Office's own rules, "[a] prima facie case of unpatentability is established when the information *compels* a conclusion that a claim is unpatentable under the *preponderance of evidence*, burden-of-proof standard..." *See* 37 C.F.R. § 1.56(b)(2)(ii) (emphasis added). Further, refusal to issue the patent in the face of failure to properly establish a *prima facie* case of obviousness or some other proper grounds for rejection places the Examiner and the USPTO in controversion of 35 U.S.C. § 131, which dictates that if after examination "it appears that the applicant is entitled to a patent under the law, the Director shall issue a patent therefor" (emphasis added).

In all of the above, the Applicants wish to emphasize the high bar to which the Examiner is held during the examination process and hereby respectfully request that in the ongoing prosecution of the present application that the Examiner provide explicit and detailed analysis of any grounds of rejection relied upon. *See, e.g., KSR International Co. v. Teleflex Inc., 550 U.S. 398 (2007)* ("[an obviousness] analysis should be made explicit," citing *In re Kahn*, 441 F.3d 977, 988 (CA Fed. 2006)).

Claims 14-17 and 20 were rejected under pre-AIA 35 USC 103(a) as being unpatentable over Farrell et al. in view of Chervin et al., U.S. Pat. No. 7,190,995. The Applicants traverse and submit that claims 14-17 and 20 as amended are patentable over Farrell in view of Chervin.

The Applicants incorporate their above comments with respect to Farrell. Given the amendments to the Claims Chervin is now moot.

Given these differences between the reference and the claimed invention, the Applicants request the Examiner withdraw this rejection.

Claims 18 and 19 were rejected under pre-AIA 35 USC 103(a) as being unpatentable over Farrell et al. in view of Chervin as applied to claim 14, and further in view of Tsukashima et al., U.S. Pat. Appln. No. 2004/0210153. The Applicants traverse and submit that claims 18 and 19 as amended are patentable over Farrell in view of Chervin.

The Applicants incorporate their above comments with respect to Farrell. Given the amendments to the Claims - both the Chervin and Tsukashima are now moot.

Given these differences between the reference and the claimed invention, the Applicants request the Examiner withdraw this rejection.

CONCLUSION:

The Applicant respectfully submits that this application is in condition for allowance and that action is earnestly solicited.

Respectfully submitted,

05/17/2021
Dated

/Brian M. Kolkowski/

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ResMed Corp. - Ex. 1002
Page 134

CLAIM AMENDMENTS:

Please amend claims 1-6, 8-13 and 15-20, cancel claims 7 and 14, and add new claims 21 and 22 as follows:

1. (currently amended) A positive airway pressure (PAP) sleeping disorder treatment system comprising

a PAP device;

a software adapted to be used on a base station, cell phone or PDA each comprising a first radio frequency wireless transceiver, a processor, the software, and a display, ~~first device for diagnosing and creating a quantitative~~ , the software further adapted for receiving data related to the subject's treatment and its efficacy, in whole or part, generated by the PAP device and to output the data, in whole or in part, ~~the severity of a subject's sleeping disorder or symptoms~~ for viewing on the display; and

a remote internet site;

~~a second~~wherein the PAP device is for ~~physically or chemically~~ treating a subject's sleeping disorder or symptoms, ~~which can be adjusted using in part the output of the level of severity of the subject's sleeping disorder~~ and further comprises:

a blower having an air output,

an airflow sensor internal to the PAP device adapted for measuring the respiratory airflow of a subject while using the PAP,

a processor adapted for generating the data related to the subject's treatment and its efficacy by receiving sensor data from the airflow sensor, and calculating both symptom data of a severity and/or an index of a subject's symptoms measured during use of the PAP device and data of usage of the PAP device,

a second radio frequency wireless transceiver, and

a mask or a nasal cannula; and

the remote internet site is adapted to receive the data related to the subject's treatment and its efficacy, in whole or part, generated by the PAP device and transmitted via the second radio frequency wireless transceiver.

2. (currently amended) The system in Claim 1, wherein the ~~first~~ PAP device for physically or chemically treating a subject's sleeping disorder is adjusted in real time based on data related to the treatment and efficacy generated by the PAP device and received by the remote internet site.

3. (currently amended) The system in Claim ~~1~~2, wherein the ~~second~~PAP device is adjusted automatically ~~adjusted by using data or~~ a signal from the ~~first device~~remote internet site based on data related to the treatment and its efficacy received.

4. (currently amended) The system in Claim 1, wherein the ~~quantitative output of the level of severity of the subject's sleeping disorder or symptoms is based in part on a physiological signal of the subject~~ the software adapted for use on the computer, cell phone or PDA receives, in whole or part, the data related to treatment generated by the PAP device and is used to retransmit the data related to treatment received by the software through the first radio frequency wireless transceiver, in whole or part, to the remote internet site.

5. (currently amended) The system in Claim 4~~1~~, wherein the ~~physiological signal is a brain wave signal~~ software adapted for use on the computer, cell phone or PDA receives, in whole or part, the data related to treatment generated by the PAP device that is received then retransmitted from the remote internet site.

6. (currently amended) The system in Claim ~~4~~1, wherein the ~~physiological signal is an EKG signal~~both the software adapted for use on the computer, cell phone or PDA and the remote internet site independently receive, in whole or part, the data related to treatment generated by the PAP device.

7. (cancelled)

8. (currently amended) The system in Claim ~~7~~4, wherein the ~~CPAP device for physically or chemically treating a subject's sleeping disorder is adjusted in real time~~second radio frequency wireless transceiver of the PAP device and the software adapted to use first radio frequency wireless transceiver of the base station, cellular phone or PDA to transmit data related to treatment using Bluetooth wireless protocol.

9. (currently amended) The system in Claim ~~7~~6, wherein the ~~CPAP device is adjusted automatically using data or a signal from the first device~~second radio frequency wireless transceiver of the PAP device and the software adapted to use first radio frequency wireless transceiver of the base station, cellular phone or PDA to transmit data related to treatment using Bluetooth wireless protocol.

10. (currently amended) The system in Claim ~~7~~5, wherein the ~~output of the level of severity of the subject's sleeping disorder or symptoms is based in part on a physiological signal of the subject~~PAP device and the remote internet site as well as the remote internet site and the software adapted for the base station, cellular phone or PDA transmit data related to treatment via cell towers or cable.

11. (currently amended) The system in Claim ~~10~~4, wherein the ~~physiological signal is a brain wave signal~~ index of the subject's symptoms is a respiratory disturbance index.

12. (currently amended) The system in Claim ~~10~~5, wherein the ~~physiological signal is an EKG signal~~ wherein the index of the subject's symptoms is a respiratory disturbance index.

13. (currently amended) The system in Claim ~~7~~6, wherein the ~~first device sends a wireless signal based in part on the output level of severity to the CPAP device to adjust a treatment of the subject~~ wherein the index of the subject's symptoms is a respiratory disturbance index.

14. (cancelled)

15. (currently amended) The system in Claim ~~1~~4, wherein the ~~second device for physically or chemically treating a subject's sleeping disorder is adjusted in real time~~software adapted for use with the base station, cellular phone or PDA can be reprogrammed or modified remotely.

16. (currently amended) The system in Claim ~~1~~45, wherein the ~~CPAP device is adjusted automatically using data or a signal from the first device~~software adapted for use with the base station, cellular phone or PDA can be reprogrammed or modified remotely.

17. (currently amended) The system in Claim ~~1~~46, wherein the ~~first device sends a wireless signal based in part on the output level of severity to the CPAP device to adjust a treatment of the subject~~software adapted for use with the base station, cellular phone or PDA can be reprogrammed or modified remotely.

18. (currently amended) The system in Claim ~~1~~4, wherein the ~~CPAP device further comprises a nebulizer~~signals from the sensors are processed using one or more of the signal processing techniques from the group consisting of a standard deviation technique, a recursively fit ARMAX system identification model, a short-time fourier transform technique, a time-frequency signal analysis with a variety of different kernals, and a wavelet analysis.

19. (currently amended) The system in Claim ~~1~~85, wherein ~~the nebulizer is used to deliver medication~~signals from the sensors are processed using one or more of the signal

processing techniques from the group consisting of a standard deviation technique, a recursively fit ARMAX system identification model, a short-time fourier transform technique, a time-frequency signal analysis with a variety of different kernals, and a wavelet analysis.

20. (currently amended) The system in Claim ~~14~~6, wherein the ~~CPAP device is adjusted by a remote control device~~signals from the sensors are processed using one or more of the signal processing techniques from the group consisting of a standard deviation technique, a recursively fit ARMAX system identification model, a short-time fourier transform technique, a time-frequency signal analysis with a variety of different kernals, and a wavelet analysis.

21. (new) The system of Claim 1, wherein the PAP device further comprises an electronic component adapted to allow the PAP device to be adjusted remotely based on the data related to treatment transmitted to the remote internet site.

22. (new) The system of Claim 6, wherein the PAP device further comprises an electronic component adapted to allow the PAP device to be adjusted remotely based on the data related to treatment transmitted to the remote internet site.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 16/057,963	Filing Date 08/08/2018	☐ To be Mailed

ENTITY: ☐ LARGE ☑ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $50 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $230 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	05/17/2021	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0		x $50 =	0
	Independent (37 CFR 1.16(h))	* 1	Minus	*** 3	= 0		x $240 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/JAMES ELLIOTT/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/057,963	08/08/2018	Hani Kayyali	CMD-105	1595

81177 7590 08/18/2021

Cleveland Medical Devices Inc.
4415 Euclid Ave. Ste. 500
Cleveland, OH 44103

EXAMINER	
NATNITHITHADHA, NAVIN	

ART UNIT	PAPER NUMBER
3791	

MAIL DATE	DELIVERY MODE
08/18/2021	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR/ PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
16/057,963	08/08/2018	Kayyali et al.	CMD-105

		EXAMINER	
Cleveland Medical Devices Inc. **4415 Euclid Ave. Ste. 500** **Cleveland, OH 44103**		NAVIN NATNITHITHADHA	
		ART UNIT	**PAPER**
		3791	20210820

DATE MAILED: _____

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Commissioner for Patents

NON-RESPONSIVE AMENDMENT AND ELECTION BY ORIGINAL PRESENTATION

(See Continuation Sheet)

/NAVIN NATNITHITHADHA/
Primary Examiner, Art Unit 3791

PTO-90C (Rev.04-03)

Notice of Pre-AIA or AIA Status

1. The present application is being examined under the pre-AIA first to invent provisions.

Response to Amendment

2. According to the Amendment, filed 17 May 2021, the status of the claims is as follows:

Claims 1-6, 8-13, and 15-20 currently amended;

Claims 21 and 22 are new; and

Claims 7 and 14 are cancelled.

Election/Restrictions

3. Independent claim 1 was amended, *see* Amendment, filed 17 May 2021, to include the features of "a PAP device", "a software…", "a remote internet site", "a blower…", an airflow sensor…", "a processor", "a second radio frequency wireless transceiver", and " a mask or a nasal cannula", and deleted the features of "a first device…" and "a second device…". Amended claim 1, along with its dependent claims 2-6, 8-13, and 15-22, is directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

> Inventions Group 1, which is original claims 1-20, filed 08 August 2018, and Group 2, which is currently amended claims 1-6, 8-13, and 15-20 and new claims 21 and 22, filed 17 May 2021, are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct if they do not overlap in scope and are not obvious variants, and if it is shown that at least one subcombination is separately usable. In the instant case, subcombination Group I has separate utility such as a sleeping disorder treatment system comprising "a first device for diagnosing and creating…", and "a second device for physically or chemically treating…"; whereas subcombination Group II has separate utility such as "a PAP device", "a software…", "a remote internet site", "a blower…", an airflow sensor…", "a processor", "a second radio

frequency wireless transceiver", and " a mask or a nasal cannula". See MPEP § 806.05(d).

4. Restriction for examination purposes as indicated is proper because all the inventions listed in this action are independent or distinct for the reasons given above and there would be a serious search and/or examination burden if restriction were not required because one or more of the following reasons apply:

There would be a serious burden for the Examiner to examine the present claims because the newly claimed invention acquired a separate status in the art due to their recognized divergent subject matter, and requires a different field of search (for example, searching different classes/subclasses or electronic resources, or employing different search queries). Furthermore, the newly claimed invention raises different non-prior art issues under 35 U.S.C. 101 and/or 35 U.S.C. 112, first paragraph.

5. Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 1-6, 8-13, and 15-22 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NAVIN NATNITHITHADHA whose telephone number is (571)272-4732. The examiner can normally be reached on Monday - Friday 6:00 am - 8:30 am & 10:30 am - 4:00 pm.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason M Sims can be reached on 571-272-7540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see https://ppair-my.uspto.gov/pair/PrivatePair. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/NAVIN NATNITHITHADHA/
Primary Examiner, Art Unit 3791
08/16/2021

DO NOT ENTER: /N.N/
08/16/2021

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re:	Application of Kayyali et al.	)	
Serial No.:	16/057,963	)	Art Unit: 3791
Filed:	August 8, 2018	)	
For:	Devices and Methods for Sleep Disorder Diagnosis and Treatment	)	Attorney Docket No.: CMD-105
Examiner:	Navin Natnithithadha	)	

May 17, 2021

AMENDMENT

Commissioner of Patents and Trademarks
Alexandria, VA 22313-1450

This amendment is being filed in response to an Office Action dated February 16, 2021 with a due date of response of May 17, 2021, 2021. The Applicants believe no extension of time is needed but if this is not the case the Applicant contingently petition for an extension of time and authorize the USPTO to deduct any fees from their deposit account 502704. The following amendments to the specification and claims are respectfully submitted.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/057,963	08/08/2018	Hani Kayyali	CMD-105	1595

81177 7590 09/02/2021

Cleveland Medical Devices Inc.
4415 Euclid Ave. Ste. 500
Cleveland, OH 44103

EXAMINER	
NATNITHITHADHA, NAVIN	

ART UNIT	PAPER NUMBER
3791	

MAIL DATE	DELIVERY MODE
09/02/2021	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Applicant-Initiated Interview Summary	**Application No.** 16/057,963	**Applicant(s)** Kayyali et al.		
	Examiner NAVIN NATNITHITHADHA	**Art Unit** 3791	**AIA (First Inventor to File) Status** No	**Page** 1 of 1

All Participants (applicant, applicants representative, PTO personnel)	**Title**	**Type**
NAVIN NATNITHITHADHA	Primary Examiner	Telephonic
Brian M. Kolkowski	Attorney of Record	

Date of Interview: 19 August 2021

Issues Discussed:

Other

Attorney traversed the Notice of Non-Responsive Amendment and Election By Original Presentation, argued that the original claims were amended, and no new claims were presented to prompt a Restriction Requirement and Election By Original Presentation.
Examiner stated that the Amendment, mailed 18 August 2021, drastically changed the scope of invention and the amended claims are now distinct from the original claims, filed 08 August 2018.
Examiner cited MPEP 818.02(a) and 821.03, and 37 CFR 1.145 in support of the finding of Election By Original Presentation.
Attorney and Examiner discussed amendments that can be made to have amended claims not be distinct from the originally filed claims.
No agreement was reached at this time as to the specific amended claims.
Attorney will file a formal response to the Notice of Non-Responsive Amendment and Election By Original Presentation.

/NAVIN NATNITHITHADHA/ Primary Examiner, Art Unit 3791	

Applicant is reminded that a complete written statement as to the substance of the interview must be made of record in the application file. It is the applicants responsibility to provide the written statement, unless the interview was initiated by the Examiner and the Examiner has indicated that a written summary will be provided. See MPEP 713.04
Please further see:
MPEP 713.04
Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews, paragraph (b)
37 CFR § 1.2 Business to be transacted in writing

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

PTO/SB/06 (09-11)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 16/057,963	Filing Date 08/08/2018	☐ To be Mailed

ENTITY: ☐ LARGE ☑ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $50 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $230 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	10/15/2021	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0		x $50 =	0
	Independent (37 CFR 1.16(h))	* 1	Minus	*** 3	= 0		x $240 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/POLIN ANG/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re:	Application of Kayyali et al.	)	
		)	
Serial No.:	16/057,963	)	
		)	Art Unit: 3791
Filed:	August 8, 2018	)	
		)	
For:	Devices and Methods for Sleep Disorder Diagnosis and Treatment	)	
		)	Attorney Docket No.: CMD-105
Examiner:	Navin Natnithithadha	)	
		)	

October 15, 2021

CORRECTED AMENDMENT

Commissioner of Patents and Trademarks
Alexandria, VA 22313-1450

This amendment is being filed in response to an Official Action dated August 18, 2021 with a due date of response of October 18, 2021. The Applicants believe no extension of time is needed but if this is not the case the Applicant contingently petition for an extension of time and authorize the USPTO to deduct any fees from their deposit account 502704. The following amendments to the specification and claims are respectfully submitted.

CLAIM AMENDMENTS:

Please amend claims 1-6, 8-13 and 15-20, cancel claims 7 and 14, and add new claims 21 and 22 as follows:

1. (currently amended) A sleeping disorder treatment system comprising

a first device or group of components adapted for ~~diagnosing and creating~~measuring and calculating data of a quantitative output of the severity of a subject's sleeping disorder ~~or~~ symptoms during treatment;~~, and~~

a second device or group of components adapted for physically or chemically treating a subject's sleeping disorder ~~or~~ symptoms, which can be used to determine whether to adjust~~ed~~ or readjust the second device or group of components using in part, the data of the quantitative output of the level of severity of the subject's sleeping disorder symptoms during treatment;

the first and second devices or groups of components both being part of a single enclosure PAP device comprising:

a blower having an air output,

an airflow sensor internal to the PAP device adapted for measuring the respiratory airflow of a subject while using the PAP,

a processor adapted for generating and outputting the data related to the subject's treatment and its efficacy by receiving sensor data from the airflow sensor, and calculating both the quantified symptom data of the severity of the sleeping disorder symptoms and/or an index of a subject's symptoms measured during use of the PAP device and data of usage of the PAP device,

a first radio frequency wireless transceiver, and

a mask or a nasal cannula;

a software adapted to be used on and to display the data to the subject or a care provider on a base station, a cell phone or a PDA, each comprising a second radio frequency wireless transceiver, a processor, the software and a display; and

a remote internet site, the remote internet site adapted to receive the data related to the subject's treatment and its efficacy, in whole or part, generated by the PAP device and transmitted via the first radio frequency wireless transceiver.

2. (currently amended) The system in Claim 1, wherein the ~~first~~ PAP device for physically or chemically treating a subject's sleeping disorder is adjusted in real time based on data related to the treatment and efficacy generated by the PAP device and received by the remote internet site.

3. (currently amended) The system in Claim ~~1~~2, wherein the ~~second~~PAP device is adjusted automatically ~~adjusted by using data or~~ a signal from the ~~first device~~remote internet site based on data related to the treatment and its efficacy received.

4. (currently amended) The system in Claim 1, wherein the ~~quantitative output of the level of severity of the subject's sleeping disorder or symptoms is based in part on a physiological signal of the subject~~ the software adapted for use on the computer, cell phone or PDA receives, in whole or part, the data related to treatment generated by the PAP device and is used to retransmit the data related to treatment received by the software through the first radio frequency wireless transceiver, in whole or part, to the remote internet site.

5. (currently amended) The system in Claim 4~~1~~, wherein the ~~physiological signal is a brain wave signal~~ software adapted for use on the computer, cell phone or PDA

receives, in whole or part, the data related to treatment generated by the PAP device that is received then retransmitted from the remote internet site.

6. (currently amended) The system in Claim 41, wherein the ~~physiological signal is an EKG signal~~both the software adapted for use on the computer, cell phone or PDA and the remote internet site independently receive, in whole or part, the data related to treatment generated by the PAP device.

7. (cancelled)

8. (currently amended) The system in Claim ~~7~~4, wherein the ~~CPAP device for physically or chemically treating a subject's sleeping disorder is adjusted in real time~~second radio frequency wireless transceiver of the PAP device and the software adapted to use first radio frequency wireless transceiver of the base station, cellular phone or PDA to transmit data related to treatment using Bluetooth wireless protocol.

9. (currently amended) The system in Claim ~~7~~6, wherein the ~~CPAP device is adjusted automatically using data or a signal from the first device~~second radio frequency wireless transceiver of the PAP device and the software adapted to use first radio frequency wireless transceiver of the base station, cellular phone or PDA to transmit data related to treatment using Bluetooth wireless protocol.

10. (currently amended) The system in Claim ~~7~~5, wherein the ~~output of the level of severity of the subject's sleeping disorder or symptoms is based in part on a physiological signal of the subject~~PAP device and the remote internet site as well as the remote internet site and the software adapted for the base station, cellular phone or PDA transmit data related to treatment via cell towers or cable.

11. (currently amended) The system in Claim ~~10~~4, wherein the ~~physiological signal is a brain wave signal~~ index of the subject's symptoms is a respiratory disturbance index.

12. (currently amended) The system in Claim ~~10~~5, wherein the ~~physiological signal is an EKG signal~~ wherein the index of the subject's symptoms is a respiratory disturbance index.

13. (currently amended) The system in Claim ~~7~~6, wherein the ~~first device sends a wireless signal based in part on the output level of severity to the CPAP device to adjust a treatment of the subject~~ wherein the index of the subject's symptoms is a respiratory disturbance index.

14. (cancelled)

15. (currently amended) The system in Claim ~~1~~4, wherein the ~~second device for physically or chemically treating a subject's sleeping disorder is adjusted in real time~~software adapted for use with the base station, cellular phone or PDA can be reprogrammed or modified remotely.

16. (currently amended) The system in Claim ~~14~~5, wherein the ~~CPAP device is adjusted automatically using data or a signal from the first device~~software adapted for use with the base station, cellular phone or PDA can be reprogrammed or modified remotely.

17. (currently amended) The system in Claim ~~14~~6, wherein the ~~first device sends a wireless signal based in part on the output level of severity to the CPAP device to adjust a treatment of the subject~~software adapted for use with the base station, cellular phone or PDA can be reprogrammed or modified remotely.

18. (currently amended) The system in Claim ~~1~~4, wherein the ~~CPAP device further comprises a nebulizer~~signals from the sensors are processed using one or more of the signal processing techniques from the group consisting of a standard deviation technique, a recursively fit ARMAX system identification model, a short-time fourier transform technique, a time-frequency signal analysis with a variety of different kernals, and a wavelet analysis.

19. (currently amended) The system in Claim ~~18~~5, wherein ~~the nebulizer is used to deliver medications~~signals from the sensors are processed using one or more of the signal processing techniques from the group consisting of a standard deviation technique, a recursively fit ARMAX system identification model, a short-time fourier transform technique, a time-frequency signal analysis with a variety of different kernals, and a wavelet analysis.

20. (currently amended) The system in Claim ~~14~~6, wherein the ~~CPAP device is adjusted by a remote control device~~signals from the sensors are processed using one or more of the signal processing techniques from the group consisting of a standard deviation technique, a recursively fit ARMAX system identification model, a short-time fourier transform technique, a time-frequency signal analysis with a variety of different kernals, and a wavelet analysis.

21. (new) The system of Claim 1, wherein the PAP device further comprises an electronic component adapted to allow the PAP device to be adjusted remotely based on the data related to treatment transmitted to the remote internet site.

22. (new) The system of Claim 6, wherein the PAP device further comprises an electronic component adapted to allow the PAP device to be adjusted remotely based on the data related to treatment transmitted to the remote internet site.

REMARKS

Claims 1-20 were rejected in the Office Action issued February 16, 2021. The Applicants have amended claims 1-6, 8-13 and 15-20, cancelled claims 7 and 14, and added new claims 21 and 22. The Applicants respectfully traverse the Examiner's objections and rejections for the reasons set forth below.

On August 19, 2021, the Examiner graciously provided an interview to the Applicants. During the Interview amendments were discussed that could be made to make sure the claims would not be subject to the restriction issued on August 18, 2021. No agreement was reached.

The Examiner has objected to the Applicants original Amendment filed on May 17, 2021. The Examiner apparently objects to the original Amendment because it amends the original claims to too large an extent including the removal of large portions of the text of the claims. The Applicants have gone back and incorporated most of the provisions of the original Claim 1 into their current Claim 1 and have for the most part have just added additional limitations to their Claim 1.

The Applicants remind the Examiner that the differences between Claims 1-14 and 15-20 in the parent case were quite similar and all were allowed. In that case there was no objection by the Examiner that an excessive burden was being placed on him even though in that case the Examiner used almost identical prior art references.

The Examiner has already performed this search. The Applicants remind the Examiner the newly amended claims are clearly a subspecies of the originally claimed invention in Claim 1 and now as such there is no undue burden placed upon the Examiner to examine this case. The Applicants herein traverse the Examiner's restriction and submit that the current claims are not independent and distinct from the originally presented claims as required by statute.

Claim Objections

Claims 2, 3, 8, 10, 14 and 15 were objected to due to an informalities. The Applicants thank the Examiner for his helpful comments and submit the claims as amended now overcomes these objections.

Anticipation under 35 U.S.C. § 102

To provide legal context as well as an analytical framework for the Applicants' remarks, the Applicants wish, as an initial point, to respectfully remind the Examiner that a proper finding of anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration. *W.L. Gore & Associates v. Garlock*, 721 F.2d 1540, 202 USPTO 202 (Fed Cir. 1983). It is not enough that the prior art reference disclose all of the claimed elements in isolation, but rather anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim. *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 221 USPQ 481 (Fed. Cir. 1984). Further, anticipation requires that the prior art reference must be enabling, thus placing the allegedly disclosed matter in the possession of the public. *Akzo N.V. v. U.S. Int'l Trade Comm'n*, 808 F.2d 1471, 1 USPQ 2d. 1241 (Fed Cir. 1986). The standard of anticipation is identity of invention. *Glaverbel Societe Anonyme v. Northlake Mktg. & Supply, Inc.*, 45 F.3d 1550, 33 U.S.P.Q.2d 1496, 1500 (Fed.Cir.1995). Identity of invention is a question of fact that requires a showing that each element of the claim in issue is found in a prior patent or publication, either expressly or inherently. *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 771, 218 USPQ 781, 789 (Fed.Cir.1983), cert. denied, 465 U.S. 1026, 104 S.Ct. 1284, 79 L.Ed.2d 687 (1984). Inherency may not be established by probabilities or possibilities. *Continental Can Co. v. Monsanto Co.*, 948 F.2d 1264, 1269 (Fed. Cir. 1991). Before burden is shifted to the applicant to disprove inherency, the examiner is required provide evidence or scientific reasoning to establish the reasonableness of the examiner's belief that a functional limitation is an inherent characteristic of the prior art. *Ex parte Skinner*, 2 USPQ 2d 1788, 1789 (BPAI 1986).

Thus, to reach a proper finding of anticipation, the examiner must show that each and every claim limitation is present in a single prior art reference (the identity of invention requirement) and that the same prior art reference enables the claimed invention so as to place the invention in the possession of a person having ordinary skill in the art (the anticipatory enablement requirement). If the examiner falls short in meeting any of these requirements then the examiner has failed to establish a *prima facie* case and the Applicants are entitled to the patent. *See In re Glaug*, 283 F.3d 1335 at 1338 (Fed. Cir. 2002) ("If the

PTO fails to meet this burden [to establish a *prima facie* case], then the applicant is entitled to the patent"). Further, refusal by the USPTO to issue the patent in the face of an examiner's failure to properly establish a *prima facie* case of anticipation or some other proper grounds for rejection places the examiner and the USPTO in contravention of 35 U.S.C. § 131, which dictates that if after examination of an application "it appears that the applicant is entitled to a patent under the law, the Director shall issue a patent therefor" (emphasis added).

Claims 1-13 were rejected under pre-AIA 35 USC 102(e) as being anticipated by Farrell et al., U.S. Pat. Appln 2007/0161913 ("Farrell"). The Applicants traverse the rejection and submit the claims as amended are not anticipated by Farrell.
With respect to Claims 1-13, Farrell does not teach or disclose a sleeping disorder treatment system comprising a first device or group of components adapted for measuring and calculating data of a quantitative output of the severity of a subject's sleeping disorder symptoms during treatment; a second device or group of components adapted for physically or chemically treating a subject's sleeping disorder symptoms, which can be adjusted using in part, if necessary, the data of the quantitative output of the level of severity of the subject's sleeping disorder symptoms during treatment; the first and second devices or groups of components being part of a PAP device comprising a blower having an air output, an airflow sensor internal to the PAP device adapted for measuring the respiratory airflow of a subject while using the PAP, a processor adapted for generating and outputting the data related to the subject's treatment and its efficacy by receiving sensor data from the airflow sensor, and calculating both the quantified symptom data of the severity of the sleeping disorder symptoms and/or an index of a subject's symptoms measured during use of the PAP device and data of usage of the PAP device, a first radio frequency wireless transceiver, and a mask or a nasal cannula; a software adapted to be used on and to display the data to the subject or a care provider on a base station, a cell phone or a PDA, each comprising a second radio frequency wireless transceiver, a processor, the software and a display; and a remote internet site, the remote internet site adapted to receive the data related to the subject's treatment and its efficacy, in whole or part, generated by the PAP device and transmitted via the first radio

frequency wireless transceiver as further claimed. Furthermore Farrell does not teach or disclose the software adapted for a base station, cellular phone or PDA that allows some form of the subject's treatment data to be displayed and viewed by the subject nor a remote internet site that allows this treatment data to be collected and reviewed for analysis, and to make therapeutic changes.

Instead Farrell discloses a tethered extremely complex system that is used to examine "changes in the patient's heart rate associated with changes in sleep disordered breathing. The events in Farrell are detected using a tethered patient interface box through which all of the sensors are connected both which are external to the enclosure of the PAP device.

Farrell also teaches of a traditional device where "[f]low F(t) and pressure Pmask(t) signals are sent to a control or microprocessor 15 to derive a pressure request signal Prequest(t). Alternatively, a flow signal f(t) and pressure signal Pmask(t) may be estimated or calculated in relation to the blower motor by monitoring current supplied to the motor and/or speed of the motor". Farrell Col. 4, lines 12-17. Farrell goes on to explain "[t]he apparatus may further include additional interface 16 for connection to additional diagnosis or patient information gathering devices. For example, a diagnosis unit may optionally include a pulse oximeter 20, respiratory movement sensors 22 such as a chest band…other automated measuring devices may also be included with the diagnosis unit as it relates to measuring other cardiovascular related information from the patient". Farrell Col 4, lines 39-56. Farrell explains it collects this data with the diagnosis unit to "associate sleep disordered breathing information and cardiovascular information over time" as shown in FIG. 2, 46.

With respect to Claim 2, Farrell does not teach or disclose the system in Claim 1 wherein the PAP device for physically or chemically treating a subject's sleeping disorder is adjusted in real time based on data related to treatment generated by the PAP device and received by the remote internet site as claimed. There is no indication in Farrell that the PAP device is configured similarly to the claimed invention's PAP device and of a remote internet site where data related to treatment and its efficacy generated by the PAP device is transmitted in order to adjust the PAP device in real time.

With respect to Claim 3, Farrell does not teach or disclose the system in Claims 1 and 2, wherein the PAP device is adjusted automatically with a signal from the remote internet site based on data related to treatment and its efficacy received as claimed. The Examiner misreads paragraph [005] in that the PAP itself is making this adjustment based on other factors.

With respect to Claim 4, Farrell does not teach or disclose the system in Claim 1 wherein the the software adapted for use on the computer, cell phone or PDA receives, in whole or part, the data related to treatment and its efficacy generated by the PAP device and is used to retransmit the data related to treatment and its efficacy received by the software through the first radio frequency wireless transceiver, in whole or part, to the remote internet site as claimed.

With respect to Claim 5, Farrell does not teach or disclose the system in Claim 1, wherein the software adapted for use on the computer, cell phone or PDA receives, in whole or part, the data related to treatment generated by the PAP device that is received then retransmitted from the remote internet site as claimed.

With respect to Claim 6, Farrell does not teach or disclose the system in Claim 1, wherein the both the software adapted for use on the computer, cell phone or PDA and the remote internet site independently receive, in whole or part, the data related to treatment and its efficacy generated by the PAP device as claimed.

With respect to Claims 8 and 9, Farrell does not teach or disclose the system in Claims 1 and further in 4 and 6, wherein the second radio frequency wireless transceiver of the PAP device and the software adapted to use the first radio frequency wireless transceiver of the base station, cellular phone or PDA to transmit data related to treatment and its efficacy use Bluetooth wireless protocol to communicate as claimed.

With respect to Claim 10, Farrell does not teach or disclose the system in Claims 1 and 5, wherein the PAP device and the remote internet site as well as the remote internet site and the software adapted for the base station, cellular phone or PDA transmit data related to treatment via cell towers or cable.

With respect to Claims 11, 12 and 13, Farrell does not teach or disclose the system in Claims 1 and further in 4, 5, and 6 wherein the index of the subject's symptoms

is a respiratory disturbance index where such index is calculated using a signal from an airflow sensor on the PAP by a processor on the PAP as claimed.

Claim 1 has been modified and amended to be similar to previously allow Claim 15 in its direct parent case Appln Ser. No. 13/440,116, which issued as U.S. Pat. No. 10,076,269. The closest prior art in that case was Bowen and Wright and the Applicants believe the arguments made in the parent case apply here – given the Examiner has established Bowen and Wright as the closest prior art. Claims 4-6, 8-13, and 15-22 were patterned after Claims 16-20 in the patent case and again the Applicants believe the closest prior art was again Bowen and Wright and the Applicants believe those same arguments apply here. The main difference between the claim allowed in the parent case and that currently being prosecuted in the instant case is that we are claiming the software instead of the base station, cellular phone or PDA, but the software is subject to being used with a base station, cellular phone or PDA, which has all the limitations of those claimed in the parent case. The same data is being transferred as in the parent case but refer to it as "data related to the subject's treatment and its efficacy" for display to the subject and their care providers. Again if it would help the Examiner, the Applicants would be open to an interview to explain in greater detail if this is not apparent.

The Applicants understand even though the amended Claims are not identical to Claims 15-20 in the parent case that it is likely the Examiner will want a terminal disclaimer to be filed in this case to overcome an obviousness type double patenting rejection. The Applicants will be willing to file such a terminal disclaimer once there is agreement that no other rejection or objection is proper.

Given the above evidence, the Applicants urge the Examiner to withdraw this rejection.

Obviousness under 35 U.S.C. § 103

To provide legal context as well as an analytical framework for the remarks that follow, the Applicant wishes at the outset to respectfully point out that obviousness under 35 U.S.C. § 103(a) is a question of law based on underlying findings of fact, and that the Examiner bears the initial burden of factually supporting any conclusion of obviousness by establishing a *prima facie* case based on the facts. *See* MPEP 2142. Additionally, if

the Examiner does not produce a *prima facie* case, the Applicant is under no obligation to submit evidence of nonobviousness. *Id.* To provide the proper factual support for an assertion of *prima facie* obviousness the Examiner must perform the factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, (1966). These factual inquiries include (1) determining the scope and content of the prior art, (2) ascertaining the differences between the claimed invention and the prior art, and (3) determining the level of ordinary skill in the art at the time of the claimed invention. *Graham* also indicates that "secondary considerations" such as commercial success, long-felt but unsolved needs, failure of others and unexpected results may be considered in determining obviousness. Importantly, "the *Graham* factors, including secondary considerations when present, are the controlling inquiries in any obviousness analysis." MPEP 2141(II) (emphasis added).

Against this backdrop it becomes clear that if the Examiner errs in performing any of the *Graham* factual inquiries, the Examiner cannot be deemed to have established a *prima facie* case of obviousness since such a conclusion would be unsupported by the factual foundation required by *Graham*. Examples of the Examiner committing error in performing the *Graham* factual inquiries include, among other things, failure to appreciate the differences between the claimed invention and the prior art (leading to a flawed conclusion under the second *Graham* factor), as well as a failure to determine the level of ordinary skill in the art (resulting in failure based on the third *Graham* factor).

With specific regard to the Examiner's obligation under the third *Graham* factor to determine the level of ordinary skill in the art at the time of the claimed invention, the Applicant would direct particular attention to the requirement that "[a]ny obviousness rejection should include, either explicitly or implicitly in view of the prior art applied, an indication of the level of ordinary skill." *See* MPEP 2141(II)(C) (emphasis added).

In addition, it is important to recognize that merely setting forth what the Examiner believes the level of ordinary skill should be or merely making the blanket assertion that the level of ordinary skill in the pertinent art is set forth in the references is insufficient to meet the Examiner's burden under the third *Graham* factor and 35 U.S.C. § 103(a) if the Examiner is relying on a combination of references to demonstrate obviousness. This is because in addition to providing an "indication of the level of ordinary skill," *MPEP 2141(II)(C)*, the Examiner must also provide an explanation of

how and why the person of ordinary skill in the art at the time of the invention would have deemed it obvious to select and combine various references relied upon by the Examiner in such a way as to render the claimed invention obvious. *See In re Vaidyanathan*, Appeal No. 2009-1404, Fed. Cir., May 19, 2010 (nonprecedential) (faulting both the BPAI and Examiner for failing to provide "any evidentiary support or reasoning for why a person of ordinary skill in the field of the invention would have deemed it obvious to select and combine various steps from different references, in the manner of the applicant" and further noting that *KSR International Co. v. Teleflex Inc., 550 U.S. 398 (2007)* "did not remove the need to anchor the analysis [of obviousness] in explanation of how a person of ordinary skill would select and apply the teachings of the references").

Thus, in order for the Examiner to properly establish a *prima facie* case of obviousness the Examiner must first make the factual inquiries required by *Graham* and, if relying on a combination of references, must further provide some motivation to combine the references from the perspective of one of ordinary skill in the art. If the Examiner falls short in meeting any of these requirements then the Examiner has failed to establish a *prima facie* case and the applicant is entitled to the patent. *See In re Glaug*, 283 F.3d 1335 at 1338 (Fed. Cir. 2002) ("If the PTO fails to meet this burden [to establish a *prima facie* case], then the applicant is entitled to the patent"). As stated in the United States Patent and Trademark Office's own rules, "[a] prima facie case of unpatentability is established when the information *compels* a conclusion that a claim is unpatentable under the *preponderance of evidence*, burden-of-proof standard..." *See* 37 C.F.R. § 1.56(b)(2)(ii) (emphasis added). Further, refusal to issue the patent in the face of failure to properly establish a *prima facie* case of obviousness or some other proper grounds for rejection places the Examiner and the USPTO in controversion of 35 U.S.C. § 131, which dictates that if after examination "it appears that the applicant is entitled to a patent under the law, the Director shall issue a patent therefor" (emphasis added).

In all of the above, the Applicants wish to emphasize the high bar to which the Examiner is held during the examination process and hereby respectfully request that in the ongoing prosecution of the present application that the Examiner provide explicit and detailed analysis of any grounds of rejection relied upon. *See, e.g., KSR International*

Co. v. Teleflex Inc., 550 U.S. 398 (2007) ("[an obviousness] analysis should be made explicit," citing *In re Kahn*, 441 F.3d 977, 988 (CA Fed. 2006)).

Claims 14-17 and 20 were rejected under pre-AIA 35 USC 103(a) as being unpatentable over Farrell et al. in view of Chervin et al., U.S. Pat. No. 7,190,995. The Applicants traverse and submit that claims 14-17 and 20 as amended are patentable over Farrell in view of Chervin.

The Applicants incorporate their above comments with respect to Farrell. Given the amendments to the Claims the reference Chervin is now moot.

Given these differences between the reference and the claimed invention, the Applicants request the Examiner withdraw this rejection.

Claims 18 and 19 were rejected under pre-AIA 35 USC 103(a) as being unpatentable over Farrell et al. in view of Chervin as applied to claim 14, and further in view of Tsukashima et al., U.S. Pat. Appln. No. 2004/0210153. The Applicants traverse and submit that claims 18 and 19 as amended are patentable over Farrell in view of Chervin.

The Applicants incorporate their above comments with respect to Farrell. Given the amendments to the Claims - both the Chervin and Tsukashima references are now moot.

Given these differences between the reference and the claimed invention, the Applicants request the Examiner withdraw this rejection.

CONCLUSION:

The Applicant respectfully submits that this application is in condition for allowance and that action is earnestly solicited.

Respectfully submitted,

10/15/2021
Dated

/Brian M. Kolkowski/

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Electronic Acknowledgement Receipt

EFS ID:	44038840
Application Number:	16057963
International Application Number:	
Confirmation Number:	1595
Title of Invention:	Devices and Methods for Sleep Disorder Diagnosis and Treatment
First Named Inventor/Applicant Name:	Hani Kayyali
Customer Number:	81177
Filer:	Brian M. Kolkowski/Mark Pennington
Filer Authorized By:	Brian M. Kolkowski
Attorney Docket Number:	CMD-105
Receipt Date:	15-OCT-2021
Filing Date:	08-AUG-2018
Time Stamp:	11:03:58
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		CMD-105_15Oct2021_corrected-amendment.pdf	243393 9f8fe386ffee3a80f9431561810c3996af35dc5e	yes	16

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	6
	Applicant Arguments/Remarks Made in an Amendment	7	16
Warnings:			
Information:			
	Total Files Size (in bytes):	243393	

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/057,963	08/08/2018	Hani Kayyali	CMD-105	1595

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EXAMINER	
NATNITHITHADHA, NAVIN	

ART UNIT	PAPER NUMBER
3791	

MAIL DATE	DELIVERY MODE
01/21/2022	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 16/057,963	Applicant(s) Kayyali et al.	
	Examiner NAVIN NATNITHITHADHA	Art Unit 3791	AIA (FITF) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 15 October 2021.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☑ This action is **FINAL.** 2b) ☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1-6,8-13 and 15-22 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1-6,8-13 and 15-22 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application is being examined under the pre-AIA first to invent provisions.

Response to Amendment

2. According to the Amendment, filed 15 October 2021, the status of the claims is as follows:

Claims 1-6, 8-13, and 15-20 are currently amended;

Claims 21 and 22 are new; and

Claims 7 and 14 are cancelled.

3. The objection to claims 2, 3, 8, 10, 14, and 15 are withdrawn in view of the Amendment, filed 15 October 2021.

4. The objection to claim 14 is rendered moot in view of the Amendment, filed 15 October 2021, which cancelled the claim.

5. The rejection of claims 14 and 17 under pre-AIA 35 U.S.C. 102(e) as being anticipated by Farrell et al., U.S. Patent Application Publication No. 2007/0161913 A1 ("Farrell"), is rendered moot in view of the Amendment, filed 15 October 2021, which cancelled the claims.

Response to Arguments

6. Applicant's arguments, see Remarks, pp. 9-12, filed 15 October 2021, with respect to the rejection of claims 1-13 under pre-AIA 35 U.S.C. 102(e) as being anticipated by Farrell, have been fully considered, but are moot in view of the new ground(s) of rejection, which was necessitated by amendment, as discussed below.

7. Applicant's arguments, see Remarks, p. 15, filed 15 October 2021, with respect to the rejection of claims 15, 16, and 20 under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Farrell in view of Chervin et al., U.S. Patent No. 7,190,995 B2 ("Chervin"), have been fully considered, but are moot in view of the new ground(s) of rejection, which was necessitated by amendment, as discussed below.

8. Applicant's arguments, see Remarks, p. 15, filed 15 October 2021, with respect to the rejection of claims 18 and 19 under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Farrell in view of Chervin, as applied to claim 14, and further in view of Tsukashima et al., U.S. Patent Application Publication No. 2004/0210153 A1 ("Tsukashima"), have been fully considered, but are moot in view of the new ground(s) of rejection, which was necessitated by amendment, as discussed below.

Claim Objections

9. Claim 1 is objected to because of the following informalities: in line 1, the recitation "… comprising" is a typographical/grammatical error, and should be amended to "… comprising:". Appropriate correction is required.

10. Claim 1 is objected to because of the following informalities: in lines 7-8, the recitation "the second device or group of components using in part, the data of the quantitative output…" is a typographical/grammatical error, and should be amended to "the second device or group of components using, in part, the data of the quantitative output…". Appropriate correction is required.

11. Claim 1 is objected to because of the following informalities: in lines 10-11, the recitation "the first and second devices or groups of components both being part of a single enclosure PAP device comprising:" does not further limit defined structural

elements properly, and should be amended to "wherein the first and second devices or groups of components both being part of a single enclosure PAP device comprising: ". Appropriate correction is required.

12. Claim 1 is objected to because of the following informalities: in lines 14-15 and 24-25, "the subject's treatment and its efficacy" lacks proper antecedent basis, and should be amended to "the subject's treatment and ~~its~~ the treatment's efficacy". Appropriate correction is required.

13. Claim 1 is objected to because of the following informalities: in line 13, "the PAP" lacks proper antecedent basis, and should be amended to "the PAP device". Appropriate correction is required.

14. Claim 2 is objected to because of the following informalities: the recitation "the treatment and efficacy" lacks proper antecedent basis, and should be amended to "the treatment and the treatment's efficacy". Appropriate correction is required.

15. Claim 3 is objected to because of the following informalities: the recitation "wherein the PAP device is *adjusted automatically a signal* from the remote internet site…" is a typographical/grammatical error. Appropriate correction is required.

16. Claim 3 is objected to because of the following informalities: the recitation "the treatment and its efficacy" lacks proper antecedent basis, and should be amended to "the treatment and ~~its~~ the treatment's efficacy". Appropriate correction is required.

17. Claim 6 is objected to because of the following informalities: the recitation "wherein the both the software" is a typographical/grammatical error, and should be amended to "wherein ~~the~~ both the software". Appropriate correction is required.

18. Claims 18-20 are objected to because of the following informalities: the recitations "the signals from the sensor are processed …" lack proper antecedent basis, and should be amended to "the sensor data ~~signals~~ from the airflow sensor is ~~are~~ processed …" (see claim 1, line 15 for the basis of this proposed amendment). Appropriate correction is required.

Claim Rejections - 35 USC § 101

19. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

20. **Claims 1-6, 8-13, and 15-22 are rejected under 35 U.S.C. 101 because the claim(s) does/do not fall within at least one of the four categories of patent eligible subject matter**.

Step 1 of the Patent Subject Matter Eligibility Guidance (see MPEP 2106.03):

The claim(s) does/do not fall within at least one of the four categories of patent eligible subject matter because the claim is directed to a computer program. MPEP 2106.03(II) states the following:

> A claim whose BRI covers both statutory and non-statutory embodiments embraces subject matter that is not eligible for patent protection and therefore is directed to non-statutory subject matter. Such claims fail the first step (Step 1: NO) and should be rejected under 35 U.S.C. 101, for at least this reason.

In addition, MPEP 2106.03(I) states the following:

> Non-limiting examples of claims that are not directed to any of the statutory categories include:
> - Products that do not have a physical or tangible form, such as information (often referred to as "data per se") or a computer program

> per se (often referred to as "software per se") when claimed as a product without any structural recitations; …
>
> …Similarly, software expressed as code or a set of instructions detached from any medium is an idea without physical embodiment. See *Microsoft Corp. v. AT&T Corp.,* 550 U.S. 437, 449, 82 USPQ2d 1400, 1407 (2007); see also *Benson,* 409 U.S. 67, 175 USPQ2d 675 (An "idea" is not patent eligible)…

Claims 1-6, 8-13, and 15-22 contain both statutory and non-statutory embodiments. While independent claim 1 contain statutory subject matter, the claims also include computer program per se, i.e. "a software adapted to be used on…", which does not have a physical or tangible form. Thus, the claims are directed to non-statutory subject matter. Note that claims 4-6, 8-10, and 15 also further limit "software".

Claim Interpretation

21. The following is a quotation of 35 U.S.C. 112(f):

> (f) Element in Claim for a Combination. – An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

The following is a quotation of pre-AIA 35 U.S.C. 112, sixth paragraph:

> An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

22. The claims in this application are given their broadest reasonable interpretation using the plain meaning of the claim language in light of the specification as it would be understood by one of ordinary skill in the art. The broadest reasonable interpretation of a claim element (also commonly referred to as a claim limitation) is limited by the description in the specification when 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph, is invoked.

As explained in MPEP § 2181, subsection I, claim limitations that meet the following three-prong test will be interpreted under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph:

(A) the claim limitation uses the term "means" or "step" or a term used as a substitute for "means" that is a generic placeholder (also called a nonce term or a non-structural term having no specific structural meaning) for performing the claimed function;

(B) the term "means" or "step" or the generic placeholder is modified by functional language, typically, but not always linked by the transition word "for" (e.g., "means for") or another linking word or phrase, such as "configured to" or "so that"; and

(C) the term "means" or "step" or the generic placeholder is not modified by sufficient structure, material, or acts for performing the claimed function.

Use of the word "means" (or "step") in a claim with functional language creates a rebuttable presumption that the claim limitation is to be treated in accordance with 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph. The presumption that the claim limitation is interpreted under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph, is rebutted when the claim limitation recites sufficient structure, material, or acts to entirely perform the recited function.

Absence of the word "means" (or "step") in a claim creates a rebuttable presumption that the claim limitation is not to be treated in accordance with 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph. The presumption that the claim limitation is not interpreted under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth

paragraph, is rebutted when the claim limitation recites function without reciting sufficient structure, material or acts to entirely perform the recited function.

Claim limitations in this application that use the word "means" (or "step") are being interpreted under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph, except as otherwise indicated in an Office action. Conversely, claim limitations in this application that do not use the word "means" (or "step") are not being interpreted under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph, except as otherwise indicated in an Office action.

This application includes one or more claim limitations that do not use the word "means," but are nonetheless being interpreted under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph, because the claim limitation(s) uses a generic placeholder that is coupled with functional language without reciting sufficient structure to perform the recited function and the generic placeholder is not preceded by a structural modifier. Such claim limitation(s) is/are:

"a first device or group of components adapted for" in claim 1, and
"a second device or group of components adapted for" in claim 1.

Because this/these claim limitation(s) is/are being interpreted under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph, it/they is/are being interpreted to cover the corresponding structure described in the specification as performing the claimed function, and equivalents thereof.

If applicant does not intend to have this/these limitation(s) interpreted under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph, applicant may: (1) amend the claim limitation(s) to avoid it/them being interpreted under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph (e.g., by reciting sufficient structure to perform the

claimed function); or (2) present a sufficient showing that the claim limitation(s) recite(s) sufficient structure to perform the claimed function so as to avoid it/them being interpreted under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph.

Claim Rejections - 35 USC § 112

23. The following is a quotation of the first paragraph of 35 U.S.C. 112(a):

> (a) IN GENERAL.—The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.

The following is a quotation of the first paragraph of pre-AIA 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

24. **Claims 1-6, 8-13, and 15-22 are rejected under 35 U.S.C. 112(a) or 35 U.S.C. 112 (pre-AIA), first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor or a joint inventor, or for applications subject to pre-AIA 35 U.S.C. 112, the inventor(s), at the time the application was filed, had possession of the claimed invention**.

Claim 1, lines 10-11, recites the limitations:

> the first and second devices or groups of components both being part of a single enclosure PAP device comprising:
> a blower having an air output,
> an airflow sensor internal to the PAP device adapted for measuring the respiratory airflow of a subject while using the PAP,
> a processor adapted for generating and outputting the data related to the subject's treatment and its efficacy by receiving sensor data from the airflow sensor, and calculating both the quantified symptom data of the

severity of the sleeping disorder symptoms and/or an index of a subject's symptoms measured during use of the PAP device and data of usage of the PAP device,
a first radio frequency wireless transceiver, and
a mask or a nasal cannula; …

Based on broadest reasonable interpretation, the scope of these limitations include both first and second devices or groups of components both include the features of the blower, airflow sensor, processor first radio frequency wireless transceiver, and mask or nasal cannula. However, Applicant's original disclosure lacks any description of two sets of a blower, airflow sensor, processor first radio frequency wireless transceiver, and mask or nasal cannula.

Dependent claims 2-6, 8-13, and 15-22 are rejected due to their dependencies, either directly or indirectly, to base claim 1.

25. The following is a quotation of 35 U.S.C. 112(b):

(b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

26. **Claims 1-6, 8-13, and 15-22 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor (or for applications subject to pre-AIA 35 U.S.C. 112, the applicant), regards as the invention**.

In claim 1, line 6, the recitation "which *can* be used to determine whether to adjust or readjust the second device or group of components…" is unclear as to whether it is part of the claim or not. Examiner suggests positively recited this recitation

to provide a positive limitation to the claim, as follows: "~~which can be used to determine~~ wherein the second device or group of components further adapted for determining whether to adjust or readjust the second device or group of components…"

In claim 1, lines 5-9, the limitation "a second device or group of components adapted for physically or chemically treating a subject's sleeping disorder symptoms, *which can be used to determine whether to adjust or readjust the second device or group of components using in part, the data of the quantitative output of the level of severity of the subject's sleeping disorder symptoms during treatment*". The phrase "a second device …, which can be used to determine whether to adjust or readjust the second device or group of components" is indefinite because whether the "second device or group of components" is actually adjusting and readjusting itself (this feature does not appear to be consistent with the original disclosure).

Claim 1, lines 10-11, recites the limitations:

> the first and second devices or groups of components both being part of a single enclosure PAP device comprising:
> a blower having an air output,
> an airflow sensor internal to the PAP device adapted for measuring the respiratory airflow of a subject while using the PAP,
> a processor adapted for generating and outputting the data related to the subject's treatment and its efficacy by receiving sensor data from the airflow sensor, and calculating both the quantified symptom data of the severity of the sleeping disorder symptoms and/or an index of a subject's symptoms measured during use of the PAP device and data of usage of the PAP device,
> a first radio frequency wireless transceiver, and
> a mask or a nasal cannula; …

It is not clear whether the recitation means both of "the first and second devices or groups of components" comprises the blower, airflow sensor, processor first radio frequency wireless transceiver, and mask or nasal cannula, or the "single enclosure

PAP device" comprises the blower, airflow sensor, processor first radio frequency wireless transceiver, and mask or nasal cannula. Examiner suggests amending this recitation to have the "single enclosure PAP device" comprise the blower, airflow sensor, processor first radio frequency wireless transceiver, and mask or nasal cannula. Furthermore, "a singled enclosure PAP device" is not properly defined as being part of the claimed invention of "[a] sleeping disorder treatment system". Examiner suggests defining the "single enclosure PAP device" in a separate paragraph as part of the claimed system rather than an extrinsic structural element of the system.

In claim 1, line 22, the limitation "a software adapted to be used on and…" is not clear as to whether the software is to be used on the "processor" or on "a base station, a cell phone or a PDA". Also, since software is conventionally stored in a processor's memory and used by a processor, does the base station, cell phone, or PDA include both of the processor and memory.

In claim 1, line 24, "a processor" defines the same element as "a processor" in line 15. It is not clear whether there is one processor or two processors in the claim. Examiner suggests using "a first processor" in line 15, and "a second processor" in line 24.

Claim 1 recites the limitation "the data related to the subject's treatment and its efficacy" in lines 14-15. There is insufficient antecedent basis for this limitation in the claim. Note that the claim recites different types of data: "data of a quantitative output of the severity of a subject's sleeping disorder symptoms during treatment", "the data related to the subject's treatment and its efficacy" and "sensor data".

Claim 1 recites the limitation "the quantified symptom data" in line 17. There is insufficient antecedent basis for this limitation in the claim. Note that the claim recites different types of data: “data of a quantitative output of the severity of a subject’s sleeping disorder symptoms during treatment”, “the data related to the subject’s treatment and its efficacy” and “sensor data”.

Claim 2 recites the limitation "data related to the treatment and efficacy generated by the PAP device and received by the remote internet site". There is insufficient antecedent basis for this limitation in the claim.

Claim 3 recites the limitation "data related to the treatment and its efficacy received". There is insufficient antecedent basis for this limitation in the claim.

Claim 4 recites the limitation "the data related to the treatment received by the software through the first radio frequency wireless transceiver, in whole or part, to the remote internet site". There is insufficient antecedent basis for this limitation in the claim.

Claim 5 recites the limitation "the data related to the treatment generated by the PAP device that is received then retransmitted from the remote internet site". There is insufficient antecedent basis for this limitation in the claim.

Claim 6 recites the limitation "the data related to the treatment generated by the PAP device ". There is insufficient antecedent basis for this limitation in the claim.

Claim 8 recites the limitation "data related to the treatment". There is insufficient antecedent basis for this limitation in the claim.

Claim 9 recites the limitation "data related to the treatment". There is insufficient antecedent basis for this limitation in the claim.

In claims 15-17, the recitation "… *can* be reprogrammed or modified remotely" is unclear as to whether it is part of the claim or not. Examiner suggests positively recited this recitation to provide a positive limitation to the claim, as follows: "…~~can~~ is configured to be reprogrammed or modified remotely".

Claim 21 recites the limitation "the data related to the treatment transmitted to the remote internet site". There is insufficient antecedent basis for this limitation in the claim.

Claim 22 recites the limitation "the data related to the treatment transmitted to the remote internet site". There is insufficient antecedent basis for this limitation in the claim.

27. **Claims 1-6, 8-13, and 15-22 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor (or for applications subject to pre-AIA 35 U.S.C. 112, the applicant), regards as the invention**.

Claim limitations "a first device or group of components adapted for" and "a second device or group of components adapted for" in claim 1 invoke 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph. However, the written description fails to disclose the corresponding structure, material, or acts for performing the entire claimed function and to clearly link the structure, material, or acts to the function. No association between the structure ("a first device or group of components adapted for" and "a second device or group of components adapted for") and the function ("measuring and calculating data of a quantitative output of the severity of a subject's sleeping disorder

or symptoms during treatment" and "physically or chemically treating a subject's sleeping disorder symptoms, which can be used to determine whether to adjust or readjust the second device or group of components using in part, the data of the quantitative output of the level of severity of the subject's sleeping disorder symptoms during treatment", respectively) can be found in the specification. Therefore, the claim is indefinite and is rejected under 35 U.S.C. 112(b) or pre-AIA 35 U.S.C. 112, second paragraph.

Claims 2-6, 8-13, and 15-22 are rejected due to their dependencies, either directly or indirectly to base claim 1.

Applicant may:

(a) Amend the claim so that the claim limitation will no longer be interpreted as a limitation under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph;

(b) Amend the written description of the specification such that it expressly recites what structure, material, or acts perform the entire claimed function, without introducing any new matter (35 U.S.C. 132(a)); or

(c) Amend the written description of the specification such that it clearly links the structure, material, or acts disclosed therein to the function recited in the claim, without introducing any new matter (35 U.S.C. 132(a)).

If applicant is of the opinion that the written description of the specification already implicitly or inherently discloses the corresponding structure, material, or acts and clearly links them to the function so that one of ordinary skill in the art would recognize what structure, material, or acts perform the claimed function, applicant should clarify the record by either:

(a) Amending the written description of the specification such that it expressly recites the corresponding structure, material, or acts for performing the claimed function and clearly links or associates the structure, material, or acts to the claimed function, without introducing any new matter (35 U.S.C. 132(a)); or

(b) Stating on the record what the corresponding structure, material, or acts, which are implicitly or inherently set forth in the written description of the specification, perform the claimed function. For more information, see 37 CFR 1.75(d) and MPEP §§ 608.01(o) and 2181.

Claim Rejections - 35 USC § 102

28. The following is a quotation of the appropriate paragraphs of pre-AIA 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

29. **Claims 1-6, 8-13, and 15-22 are rejected under pre-AIA 35 U.S.C. 102(e) as being anticipated by Farrell et al., U.S. Patent Application Publication No. 2007/0161913 A1 ("Farrell").**

As to Claim 1, Farrell teaches the following:

A sleeping disorder treatment system ("apparatus for treating and monitoring sleep disordered breathing ("SDB")", not labeled) (see "This invention relates to methods and apparatus for treating and monitoring sleep disordered breathing ("SDB") in patients with

cardiovascular disease or otherwise monitoring the cardiovascular condition of SDB patients." in para. [0002], and see fig. 1) comprising

a first device or group of components ("microprocessor 16") adapted for measuring and calculating data of a quantitative output of the severity of a subject's sleeping disorder or symptoms during treatment (see "Preferably, the device provides ***efficacy tracking by detecting and recording or scoring SDB events or related information or indices over time, for example, by tracking or detecting central apneas, obstructive apneas, hypopneas, partial obstructions (e.g., flow flattening) or snoring***. This is illustrated in step 44 of FIG. 2. Similarly, pressure and/or flow versus time data may also be recorded for analysis. In so doing, the device preferably performs compliance tracking in which the time on and time off of the mask are recorded with SDB related events for evaluation by statistical summaries and charting. Methods for detecting and recording such information are known in the art, and may be implemented as described in U.S. Pat. No. 5,704,345." in para. [0036]; and see "For example, the device may record AHI (apnea hypopnea index) over time or during particular time periods such as session-by-session, day-by-day, hour-by-hour, etc. In one embodiment of the invention ***an AHI scoring scheme may be implemented as follows: [0038] (i) An apnea is scored if a 2 second moving average ventilation drops below 25% of a recent average ventilation***

(time constant=100s) for at least 10 consecutive seconds, [0039] (ii) An hypopnea is scored if the 8 second moving average drops below 50% but not more than 25% of the recent average ventilation for 10 consecutive seconds. Similarly, the device may determine an index comparing central apneas versus obstructive apneas as disclosed in U.S. Pat. No. 6,832,609, the entire disclosure of which is incorporated by reference herein." in para. [0036]),

a second device or group of components (at least "controller 15") adapted for physically or chemically treating a subject's sleeping disorder symptoms, which can be used to determine whether to adjust or readjust the second device or group of components using in part, the data of the quantitative output of the level of severity of the subject's sleeping disorder symptoms during treatment (see "A controller 15 or processor is configured and adapted to implement the methodology described in more detail herein and may include integrated chips, a memory and/or other instruction or data storage medium. … *With such a controller, the apparatus can be used for many different pressure treatment therapies simply by adjusting the pressure delivery equation that is used to set the speed of the blower or to manipulate the venting with the release valve*." in para. [0025]; and see "Optionally, *the therapeutic pressure levels of the above protocols* may be preset by a clinician or *may be automatically adjusted or set by automatic detection of SDB related events, such as apneas (obstructive or*

central), hypopneas, partial obstruction, snoring, etc. as disclosed in U.S. Pat. 5,704,345 (Berthon-Jones). For example, *the IPAP or EPAP levels may be adjusted by the automated determination to hunt for a minimal pressure that will be required to prevent or alleviate obstruction*. Other alternative methods to vary the therapeutic level of the pressure for treatment to a patient and to detect SDB events may be utilized and are known in the art." in para. [0032]);

the first and second devices or groups of components both being part of a single enclosure PAP device ("pressure delivery device", not labeled, see large enclosure in fig. 1) (see "With reference to FIG. 1, the invention involves *a pressure delivery device that may include a servo-controlled blower 2, a mask 6, and an air delivery conduit 8 for connection between the blower 2 and the mask 6*. Exhaust gas is vented via exhaust 13. Optionally, a flow sensor 4f and/or pressure sensor 4p may also be utilized in which case mask flow may be measured using a pneumotachograph and differential pressure transducer or similar device to derive a flow signal F(t), and mask pressure is measured at a pressure tap using a pressure transducer to derive a pressure signal P.sub.mask(t). The pressure sensor 4f and flow sensor 4p have only been shown symbolically in FIG. 1 since it is understood that those skilled in the art would understand how to measure flow and pressure." in para. [0024]) comprising:

a blower ("servo-controlled blower") 2 having an air output (see fig. 1),

an airflow sensor ("flow sensor") 4f internal to the PAP device adapted for measuring the respiratory airflow of a subject while using the PAP (see para. [0024]),

a processor ("microprocessor") 16 adapted for generating and outputting the data related to the subject's treatment and its efficacy by receiving sensor data from the airflow sensor 4f, and calculating both the quantified symptom data of the severity of the sleeping disorder symptoms and/or an index of a subject's symptoms measured during use of the PAP device ("pressure delivery device") and data of usage of the PAP device ("pressure delivery device") (see "For example, the device may record AHI (apnea hypopnea index) over time or during particular time periods such as session-by-session, day-by-day, hour-by-hour, etc. In one embodiment of the invention ***an AHI scoring scheme may be implemented as follows: [0038] (i) An apnea is scored if a 2 second moving average ventilation drops below 25% of a recent average ventilation (time constant=100s) for at least 10 consecutive seconds, [0039] (ii) An hypopnea is scored if the 8 second moving average drops below 50% but not more than 25% of the recent average ventilation for 10 consecutive seconds***. Similarly, the device may determine an index comparing central apneas

versus obstructive apneas as disclosed in U.S. Pat. No. 6,832,609, the entire disclosure of which is incorporated by reference herein." in para. [0036]),

a first radio frequency wireless transceiver (see "... a communication port or module 10, for example, a wireless communication transceiver and/or a network card, for communication with other devices or computers such as hand-held display and control devices 12." in para. [0026]), and

a mask or a nasal cannula ("mask") 6 (see fig. 1);

a software adapted to be used on and to display the data to the subject or a care provider on a base station, a cell phone or a PDA ("hand-held display and control devices") 12 (see fig. 1), each comprising a second radio frequency wireless transceiver, a processor, the software and a display (see "... other devices or computers such as hand-held display and control devices 12." in para. [0026]; and see "For example, programmed instructions with the control methodology may be coded on integrated chips in the memory of the device or such instructions may be loaded as software." in para. [0025]); and

a remote internet site ("secure electronic network to a database", not labeled), the remote internet site adapted to receive the data related to the subject's treatment and its efficacy, in whole or part, generated by the PAP device and transmitted via the first radio frequency wireless transceiver (see "Preferably, the cardiovascular and SDB information may be periodically

remotely transferred to the physician or it may be accessed directly through displays on the device. In this way, a physician may keep up with and observe the changing cardiovascular condition of the patient with minimal direct oversight or intervention. Optionally, the device can be programmed with thresholds for comparison to the recorded cardiovascular information to trigger an alarm or send a message or generate a warning for the user, clinician or physician either directly on the device, or remotely, for example, over a secure electronic network to a database." in para. [0047]).

As to Claim 2, Farrell teaches the following:

wherein the PAP device for physically or chemically treating a subject's sleeping disorder is adjusted in real time based on data related to the treatment and efficacy generated by the PAP device and received by the remote internet site (see "The AUTOSET T.TM. device ***continuously*** monitors the state of the patient's airway and determines an appropriate pressure to treat the patient, increasing it or decreasing it ***as necessary***." in para. [0005]).

As to Claim 3, Farrell teaches the following:

wherein the PAP device is adjusted automatically a signal from the remote internet site based on data related to the treatment and its efficacy received (see "The AUTOSET T.TM. device ***continuously*** monitors the state of the patient's airway and ***determines an appropriate pressure to treat***

the patient, increasing it or decreasing it as necessary." in para. [0005]).

As to Claim 4, Farrell teaches the following:

wherein the software (see "software" in para. [0025]) adapted for use on the computer, cell phone or PDA receives, in whole or part, the data related to treatment generated by the PAP device and is used to retransmit the data related to treatment received by the software through the first radio frequency wireless transceiver, in whole or part, to the remote internet site (see "Preferably, the cardiovascular and SDB information may be periodically remotely transferred to the physician or it may be accessed directly through displays on the device. In this way, a physician may keep up with and observe the changing cardiovascular condition of the patient with minimal direct oversight or intervention. Optionally, the device can be programmed with thresholds for comparison to the recorded cardiovascular information to trigger an alarm or send a message or generate a warning for the user, clinician or physician either directly on the device, or remotely, for example, over a secure electronic network to a database." in para. [0047]).

As to Claim 5, Farrell teaches the following:

wherein the software (see "software" in para. [0025]) adapted for use on the computer, cell phone or PDA receives, in whole or part, the data related to treatment generated by the PAP device that is received then retransmitted from the remote internet site (see "Preferably, the cardiovascular and SDB information

may be periodically remotely transferred to the physician or it may be accessed directly through displays on the device. In this way, a physician may keep up with and observe the changing cardiovascular condition of the patient with minimal direct oversight or intervention. Optionally, the device can be programmed with thresholds for comparison to the recorded cardiovascular information to trigger an alarm or send a message or generate a warning for the user, clinician or physician either directly on the device, or remotely, for example, over a secure electronic network to a database." in para. [0047]).

As to Claim 6, Farrell teaches the following:

wherein the both the software (see "software" in para. [0025]) adapted for use on the computer, cell phone or PDA and the remote internet site independently receive, in whole or part, the data related to treatment generated by the PAP device (see "Preferably, the cardiovascular and SDB information may be periodically remotely transferred to the physician or it may be accessed directly through displays on the device. In this way, a physician may keep up with and observe the changing cardiovascular condition of the patient with minimal direct oversight or intervention. Optionally, the device can be programmed with thresholds for comparison to the recorded cardiovascular information to trigger an alarm or send a message or generate a warning for the user, clinician or physician

either directly on the device, or remotely, for example, over a secure electronic network to a database." in para. [0047]).

As to Claims 11-13, Farrell teaches the following:

wherein the index of the subject's symptoms is a respiratory disturbance index ("AHI (apnea hypopnea index) over time or during particular time periods") (see "For example, the device may record AHI (apnea hypopnea index) over time or during particular time periods such as session-by-session, day-by-day, hour-by-hour, etc. In one embodiment of the invention an AHI scoring scheme may be implemented as follows: [0038] (i) An apnea is scored if a 2 second moving average ventilation drops below 25% of a recent average ventilation (time constant=100s) for at least 10 consecutive seconds, [0039] (ii) An hypopnea is scored if the 8 second moving average drops below 50% but not more than 25% of the recent average ventilation for 10 consecutive seconds." in para. [0037] and see "" in para. [0071]).

As to Claims 15-17, Farrell teaches the following:

wherein the software (see "software" in para. [0025]) adapted for use with the base station, cellular phone or PDA can be reprogrammed or modified remotely (see para. [0028], [0042], and [0047]).

As to Claims 21 and 22, Farrell teaches the following:

wherein the PAP device further comprises an electronic component adapted to allow the PAP device to be adjusted remotely based on the data related to treatment transmitted to the remote internet site (see para. [0028], [0042], and [0047]).

Claim Rejections - 35 USC § 103

30. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries for establishing a background for determining obviousness under pre-AIA 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.

3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under pre-AIA 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of pre-AIA 35 U.S.C. 103(c) and potential pre-AIA 35 U.S.C. 102(e), (f) or (g) prior art under pre-AIA 35 U.S.C. 103(a).

31. **Claims 8-10 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Farrell, as applied to claims 4, 6, and 5, respectively, above, and further in view of Hedner et al., U.S. Patent Application Publication No. 2008/0257349 A1 ("Hedner")**.

As to Claims 8 and 9, Farrell teaches the subject matter of claims 4 and 6, respectively, above. Farrell does not teach the following:

wherein the second radio frequency wireless transceiver of the PAP device and the software adapted to use first radio frequency wireless transceiver of the base station, cellular phone or PDA to transmit data related to treatment using Bluetooth wireless protocol.

However, using Bluetooth wireless protocol to transmit data between a PAP device and an external device is a well-known feature in the art. For example, Hedner teaches the following:

second radio frequency wireless transceiver ("communication means (not shown)", not labeled) of a PAP device ("ventilator device") 4 and
a software adapted to use a radio frequency wireless transceiver ("communication means (not shown)", not labeled) of a base station, cellular phone or PDA ("external computational device", not labeled) to transmit data related to treatment using Bluetooth wireless protocol (see "The communication means can be of a serial type like for instance according to the standards RS232, RS485, USB, Ethernet, or Firewire, or of a parallel type

like for instance according to the standards Centronics, ISA, PCI, or GPIB/HPIB. It may also be any wireless system of the standards in the IEEE 802.11 series, HiperLAN, Bluetooth, IR, GSM, GPRS, or UMTS, or any other appropriate fixed or wireless communication system." in para. [0031]).

Thus, it would have been obvious for one of ordinary skill in the art at the time the present application was effectively filed to modify Farrell's "... a communication port or module 10, for example, a wireless communication transceiver and/or a network card, for communication with other devices or computers such as hand-held display and control devices 12." (see Farrell, para. [0026]) to use Bluetooth wireless protocol, as taught by Hedner, because these are alternative standardized wireless communication formats known in the art (see Hedner, para. [0031]).

As to Claim 10, Farrell teaches the subject matter of claim 5 above. Farrell does not teach the following:

wherein the PAP device and the remote internet site as well as the remote internet site and the software adapted for the base station, cellular phone or PDA transmit data related to treatment via cell towers or cable.

However, using cable to communicate data between a PAP device and an external device is a well-known feature in the art. For example, Hedner teaches the following:

a PAP device ("ventilator device") 4 and the remote internet site as well as the remote internet site and the software adapted for the base station, cellular phone or

PDA ("external computational device", not labeled) transmit data related to treatment via cell towers or cable (see "The communication means can be of a serial type like for instance according to the standards RS232, RS485, USB, Ethernet, or Firewire, or of a parallel type like for instance according to the standards Centronics, ISA, PCI, or GPIB/HPIB. … It can also be of any proprietary non-standardized communication formats, whether it is wireless or ***wired***." in para. [0031]).

Thus, it would have been obvious for one of ordinary skill in the art at the time the present application was effectively filed to modify Farrell's "... a communication port or module 10, for example, a wireless communication transceiver and/or a network card, for communication with other devices or computers such as hand-held display and control devices 12." (see Farrell, para. [0026]) to transmit data via cable, as taught by Hedner, because these are alternative standardized wireless communication formats known in the art (see Hedner, para. [0031]).

Allowable Subject Matter

32. Claims 18-20 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 101, set forth in this Office Action.

33. Claims 18-20 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, set forth in this Office Action.

34. The following is a statement of reasons for the indication of allowable subject matter:

As to Claims 18-20, Farrell teaches the subject matter of claims 4-6, as discussed above. However, neither Farrell, Chervin, Tsukashima, nor the prior art of record teaches the sleeping disorder treatment system of base claims 4-6, including the following, in combination with all other limitations of the base claims:

> wherein signals from the sensors are processed using one or more of the signal processing techniques from the group consisting of a standard deviation technique, a recursively fit ARMAX system identification model, a short-time fourier transform technique, a time-frequency signal analysis with a variety of different kernals, and a wavelet analysis.

Conclusion

35. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

36. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NAVIN NATNITHITHADHA whose telephone number is

(571)272-4732. The examiner can normally be reached on Monday - Friday 6:00 am - 8:30 am & 10:30 am - 4:00 pm.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason M Sims can be reached on 571-272-7540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see https://ppair-my.uspto.gov/pair/PrivatePair. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/NAVIN NATNITHITHADHA/
Primary Examiner, Art Unit 3791
01/19/2022

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/057,963	Kayyali et al.
	Examiner	Art Unit
	NAVIN NATNITHITHADHA	3791

CPC - Searched*		
Symbol	**Date**	**Examiner**
A61B5/085 or A61M16/026 or A61M16/0069 or A61B5/02055 or A61B5/4815 or A61M16/0051 or A61M2205/3553 or A61M2205/3561 or A61M2205/3584 or A61M2205/3592 or A61M2016/0027 or A61M2016/0039 or A61M2202/0208 or A61M2230/04 or A61M2230/10 or A61M2230/14 or A61M2230/202 or A61M2230/205 or A61M2230/60	02/11/2021	/NN/
A61B5/085 or A61M16/026 or A61M16/0069 or A61B5/02055 or A61B5/4815 or A61M16/0051 or A61M2205/3553 or A61M2205/3561 or A61M2205/3584 or A61M2205/3592 or A61M2016/0027 or A61M2016/0039 or A61M2202/0208 or A61M2230/04 or A61M2230/10 or A61M2230/14 or A61M2230/202 or A61M2230/205 or A61M2230/60	01/14/2022	/NN/

CPC Combination Sets - Searched*		
Symbol	**Date**	**Examiner**

US Classification - Searched*			
Class	**Subclass**	**Date**	**Examiner**
600	484,529-543	02/11/2021	/NN/
600	484,529-543	01/14/2022	/NN/

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

/N.N/ Primary Examiner, Art Unit 3791	

ResMed Corp. - Ex. 1002
Page 200

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/057,963	Kayyali et al.
	Examiner	**Art Unit**
	NAVIN NATNITHITHADHA	3791

Search Notes		
Search Notes	**Date**	**Examiner**
EAST (attached): USPAT, US-PGPUB, EPO, JPO, Derwent, Keyword, Forward/Backward Citation, Assignee, Inventor, USPC, CPC searches	02/11/2021	/NN/
EAST (attached): USPAT, US-PGPUB, EPO, JPO, Derwent, Keyword, Forward/Backward Citation, Assignee, Inventor, Art of Record, USPC, CPC searches	01/14/2022	/NN/

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**
	A61B5/085 or A61M16/026 or A61M16/0069 or A61B5/02055 or A61B5/4815 or A61M16/0051 or A61M2205/3553 or A61M2205/3561 or A61M2205/3584 or A61M2205/3592 or A61M2016/0027 or A61M2016/0039 or A61M2202/0208 or A61M2230/04 or A61M2230/10 or A61M2230/14 or A61M2230/202 or A61M2230/205 or A61M2230/60		/NN/

/N.N/ Primary Examiner, Art Unit 3791	

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L2	1	(US-20070161913-$).did.	US-PGPUB	OR	ON	2022/01/19 12:14
L3	1	(internent OR network OR worldwideweb OR web) AND L2	US-PGPUB; USPAT; USOCR	OR	ON	2022/01/19 12:16
L4	1	(internet OR network OR worldwideweb OR web) AND L2	US-PGPUB; USPAT; USOCR	OR	ON	2022/01/19 12:17
L5	0	(bluetooth OR (blue ADJ2 tooth)) AND L2	US-PGPUB; USPAT; USOCR	OR	ON	2022/01/19 12:59
L6	1	(index) AND L2	US-PGPUB; USPAT; USOCR	OR	ON	2022/01/19 13:00
L7	1	(AHI) AND L2	US-PGPUB; USPAT; USOCR	OR	ON	2022/01/19 13:03
L8	1	(remote$4) AND L2	US-PGPUB; USPAT; USOCR	OR	ON	2022/01/19 13:22
L9	77	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-20100258126-$ or US-20040210153-$).did. or (US-7575005-$ or US-7190995-$ or US-	US-PGPUB; USPAT	OR	ON	2022/01/19 13:25

		6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$ or US-7662101-$ or US-7878198-$ or US-8172766-$ or US-5704345-$ or US-5353788-$ or US-8069852-$ or US-7942824-$ or US-8365730-$).did. or (US-8545416-$ or US-8356594-$ or US-5237990-$ or US-7757690-$ or US-6475153-$ or US-6533729-$ or US-8308641-$ or US-10543328-$ or US-10076269-$ or US-9533114-$ or US-5803078-$ or US-6532959-$ or US-6532957-$ or US-6336454-$ or US-6332463-$ or US-6237593-$ or US-6152129-$ or US-5794615-$ or US-5740795-$ or US-5630413-$).did.				
L10	0	((bluetooth OR (blue ADJ2 tooth)) SAME (cellular OR cell OR mobile)) AND L2	US-PGPUB; USPAT; USOCR	OR	ON	2022/01/19 13:30
L11	5	((bluetooth OR (blue ADJ2 tooth)) SAME (cellular OR cell OR mobile)) AND L9	US-PGPUB; USPAT; USOCR	OR	ON	2022/01/19 13:31
L12	17	((bluetooth OR (blue ADJ2 tooth))) AND L9	US-PGPUB; USPAT; USOCR	OR	ON	2022/01/19 13:55

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re:	Application of Kayyali et al.	)	
		)	
Serial No.:	16/057,963	)	
		)	Art Unit: 3791
Filed:	August 8, 2018	)	
		)	
For:	Devices and Methods for Sleep Disorder Diagnosis and Treatment	)	
		)	Attorney Docket No.: CMD-105
Examiner:	Navin Natnithithadha	)	
		)	

April 20, 2022

AMENDMENT AFTER FINAL

Commissioner of Patents and Trademarks
Alexandria, VA 22313-1450

Dear Sir/Mam:

This amendment is being filed in response to an Final Office Action dated January 21, 2022 with a due date of response of April 21, 2022. The Applicants believe no extension of time is needed but if this is not the case the Applicant contingently petition for an extension of time and authorize the USPTO to deduct any fees from their deposit account 502704. The following amendments to the specification and claims are respectfully submitted.

CLAIM AMENDMENTS:

Please amend claims 2-6, 8-10, 15-17 and 20-21, and cancel claims 1 and 18-20 as follows:

1. (cancelled)

2. (currently amended) The system in Claim ~~1~~4, wherein the PAP device for physically or chemically treating a subject's sleeping disorder is adjusted in real time based on ~~a~~the data related to the treatment and the treatment's efficacy generated by the PAP device and received by the remote internet site.

3. (currently amended) The system in Claim 2, wherein the PAP device is adjusted automatically with a signal from the remote internet site based on the data related to the treatment and ~~its~~the treatment's efficacy received.

4. (currently amended) ~~The system in Claim 1, wherein the the software adapted for use on the computer, cell phone or PDA receives, in whole or part, the data related to treatment generated by the PAP device and is used to~~ A sleeping disorder treatment system comprising:

a first device or group of components adapted for measuring and calculating a data of a quantitative output of the severity of a subject's sleeping disorder symptoms during a treatment and further providing for a data related the subject's treatment and the treatment's efficacy;

a second device or group of components adapted for physically or chemically treating a subject's sleeping disorder symptoms,

wherein the first device or group of components can be used to adjust or re-adjust the second device or group of components using, in part, the data of the quantitative output of the level of severity of the subject's sleeping disorder symptoms during treatment;

wherein the first and second devices or groups of components together being part of a single enclosure, single PAP device, the PAP device comprising:

a blower having an air output,

an airflow sensor internal to the PAP device adapted for measuring the respiratory airflow of a subject while using the PAP device,

a first processor adapted for generating and outputting the data related to the subject's treatment and the treatment's efficacy by receiving sensor data from the airflow sensor, and calculating both the quantified symptom data of the severity of the sleeping disorder symptoms and/or an index of a subject's symptoms measured during use of the PAP device, and data of usage of the PAP device,

a first radio frequency wireless transceiver, and

a mask or a nasal cannula;

a software stored on a non-transitory computer readable medium and executable by a second processor, the software adapted to be used with and to display the data related to the subject's treatment and the treatment's efficacy to the subject or a care provider by using a base station, a cell phone or a PDA, each comprising a second radio frequency wireless transceiver, the second processor and a display; and

a remote internet site, the remote internet site adapted to receive the data related to the subject's treatment and the treatment's efficacy, in whole or part, generated by the PAP device and transmitted via the first radio frequency wireless transceiver

wherein the software is further adapted to retransmit ~~the~~a data related to the subject's treatment and the treatment's efficacy received by the software ~~through~~from the first radio frequency wireless transceiver of the PAP device, in whole or part, to the remote internet site; and

wherein the sensor data from the sensors is processed by the first processor using one or more of the signal processing techniques from the group consisting of a standard deviation technique, a recursively fit ARMAX system identification model, a short-time fourier transform technique, a time-frequency signal analysis with a variety of different kernals, and a wavelet analysis.

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5. (currently amended) ~~The system in Claim 1, wherein the software adapted for use on the computer, cell phone or PDA receives, in whole or part,~~ A sleeping disorder treatment system comprising:

a first device or group of components adapted for measuring and calculating a data of a quantitative output of the severity of a subject's sleeping disorder symptoms during a treatment and further providing for a data related the subject's treatment and the treatment's efficacy;

a second device or group of components adapted for physically or chemically treating a subject's sleeping disorder symptoms,

wherein the first device or group of components can be used to adjust or re-adjust the second device or group of components using, in part, the data of the quantitative output of the level of severity of the subject's sleeping disorder symptoms during treatment;

wherein the first and second devices or groups of components together being part of a single enclosure, single PAP device, the PAP device comprising:

a blower having an air output,

an airflow sensor internal to the PAP device adapted for measuring the respiratory airflow of a subject while using the PAP device,

a first processor adapted for generating and outputting the data related to the subject's treatment and the treatment's efficacy by receiving sensor data from the airflow sensor, and calculating both the quantified symptom data of the severity of the sleeping disorder symptoms and/or an index of a subject's symptoms measured during use of the PAP device, and data of usage of the PAP device,

a first radio frequency wireless transceiver, and

a mask or a nasal cannula;

a software stored on a non-transitory computer readable medium and executable by a second processor, the software adapted to be used with and to display the data related to the subject's treatment and the treatment's efficacy to the subject or a care provider by using a base station, a cell phone or a PDA, each comprising a second radio frequency wireless transceiver, the second processor and a display; and

a remote internet site, the remote internet site adapted to receive the data related to the subject's treatment and the treatment's efficacy, in whole or part, generated by the PAP device and transmitted via the first radio frequency wireless transceiver

wherein the software is further adapted to receive, in whole or part, the data related to the subject's treatment and the treatment's efficacy generated by the PAP device that is first received by then retransmitted from the remote internet site; and

wherein the sensor data from the sensors is processed by the first processor using one or more of the signal processing techniques from the group consisting of a standard deviation technique, a recursively fit ARMAX system identification model, a short-time fourier transform technique, a time-frequency signal analysis with a variety of different kernals, and a wavelet analysis.

6. (currently amended) ~~The system in Claim 1, wherein the~~ A sleeping disorder treatment system comprising:

a first device or group of components adapted for measuring and calculating a data of a quantitative output of the severity of a subject's sleeping disorder symptoms during a treatment and further providing for a data related the subject's treatment and the treatment's efficacy;

a second device or group of components adapted for physically or chemically treating a subject's sleeping disorder symptoms,

wherein the first device or group of components can be used to adjust or re-adjust the second device or group of components using, in part, the data of the quantitative output of the level of severity of the subject's sleeping disorder symptoms during treatment;

wherein the first and second devices or groups of components together being part of a single enclosure, single PAP device, the PAP device comprising:

a blower having an air output,

an airflow sensor internal to the PAP device adapted for measuring the respiratory airflow of a subject while using the PAP device,

a first processor adapted for generating and outputting the data related to the subject's treatment and the treatment's efficacy by receiving sensor data from the airflow sensor, and calculating both the quantified symptom data of the severity of the sleeping disorder symptoms and/or an index of a subject's symptoms measured during use of the PAP device, and data of usage of the PAP device,

a first radio frequency wireless transceiver, and

a mask or a nasal cannula;

a software stored on a non-transitory computer readable medium and executable by a second processor, the software adapted to be used with and to display the data related to the subject's treatment and the treatment's efficacy to the subject or a care provider by using a base station, a cell phone or a PDA, each comprising a second radio frequency wireless transceiver, the second processor and a display; and

a remote internet site, the remote internet site adapted to receive the data related to the subject's treatment and the treatment's efficacy, in whole or part, generated by the PAP device and transmitted via the first radio frequency wireless transceiver

wherein both the software ~~adapted for use on the computer, cell phone or PDA~~ and the remote internet site independently receive, in whole or part, the data related to the subject's treatment and the treatment's efficacy generated by the PAP device; and

wherein the sensor data from the sensors is processed by the first processor using one or more of the signal processing techniques from the group consisting of a standard deviation technique, a recursively fit ARMAX system identification model, a short-time fourier transform technique, a time-frequency signal analysis with a variety of different kernals, and a wavelet analysis.

7. (cancelled)

8. (currently amended) The system in Claim 4, wherein the ~~second~~first radio frequency wireless transceiver of the PAP device and the software adapted to use ~~first~~second radio frequency wireless transceiver of the base station, cellular phone or PDA to transmit the data related to treatment between each other using Bluetooth wireless protocol.

9. (currently amended) The system in Claim 6, wherein the ~~second~~first radio frequency wireless transceiver of the PAP device and the software adapted to use ~~first~~second radio frequency wireless transceiver of the base station, cellular phone or PDA to transmit the data

related to the subject's treatment and the treatment's efficacy between each other using Bluetooth wireless protocol.

10. (currently amended) The system in Claim 5, wherein the PAP device and the remote internet site as well as the remote internet site and the software adapted for the base station, cellular phone or PDA transmit the data related to the subject's treatment and the treatment's efficacy via cell towers or cable.

11. (previously presented) The system in Claim 4, wherein the index of the subject's symptoms is a respiratory disturbance index.

12. (previously presented) The system in Claim 5, wherein the wherein the index of the subject's symptoms is a respiratory disturbance index.

13. (previously presented) The system in Claim 6, wherein the wherein the index of the subject's symptoms is a respiratory disturbance index.

14. (cancelled)

15. (currently amended) The system in Claim 4, wherein the software adapted for use with the base station, cellular phone or PDA ~~can~~is configured to be reprogrammed or modified remotely.

16. (currently amended) The system in Claim 5, wherein the software adapted for use with the base station, cellular phone or PDA ~~can~~is configured to be reprogrammed or modified remotely.

17. (currently amended) The system in Claim 6, wherein the software adapted for use with the base station, cellular phone or PDA ~~can~~is configured to be reprogrammed or modified remotely.

18. (cancelled)

19. (cancelled)

20. (cancelled)

21. (currently amended) The system of Claim ~~1~~5, wherein the PAP device further comprises an electronic component adapted to allow the PAP device to be adjusted remotely based on the data related to the subject's treatment and the treatment's efficacy transmitted to the remote internet site.

22. (currently amended) The system of Claim 6, wherein the PAP device further comprises an electronic component adapted to allow the PAP device to be adjusted remotely based on the data related to the subject's treatment and the treatment's efficacy treatment transmitted to the remote internet site.

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REMARKS

Claims 1-6, 8-13, and 15-22 were rejected in the Office Action issued January 21, 2022. The Applicants have amended claims 2-6, 8-10, 15-17 and 20-21, and cancelled claims 1 and 18-20, which have been incorporated into claims 4-6 as the new independent claims. The Applicants respectfully traverse the Examiner's objections and rejections for the reasons set forth below.

On April 18, 2022, the Applicants spoke with the Examiner about amending the set of claims to clarify them and overcome the respective objections and rejections as well. The Applicants have amended claims 4, 5 and 6 to include the limitations of claim 1 into each of these claims as well as the limitations of claims 18-20 respectively, which were found allowable over the prior art as well respectively as well into each of these claims. The Examiner suggested to provide this in a response, which the Applicants are doing as follows.

Claim Objections

Claims 1, 2, 3, 6 and 18-20 were objected to due to an informalities. The Applicants thank the Examiner for his helpful comments and submit the claims as amended now overcomes these objections.

Claim Rejections – 35 U.S.C. § 101

Claims 1-6, 8-13 and 15-22 were rejected under 35 USC 101 because the claim(s) does/do not fall within at least one of the four categories of patent eligible subject matter.

Claims 4, 5 and 6 have been modified to reflect that "a software" is "stored on a non-transitory computer readable medium and executable by a second processor" clarifying the claim and making this rejection moot.

Claim Interpretation – 35 U.S.C. § 112(f)

The Applicants traverse and rebut that "a first device or group of components adapted for", and "a second device or group of components adapted for" do not cite sufficient structure to perform the claimed function given the claims are also further limited in that "wherein the first and second devices or groups of components together being part of a single enclosure PAP device, the PAP device comprising a blower having an air output, an airflow sensor internal to

the PAP device adapted for measuring the respiratory airflow of a subject while using the PAP device, a processor adapted for generating and outputting the data related to the subject's treatment and the treatment's efficacy by receiving sensor data from the airflow sensor, and calculating both the quantified symptom data of the severity of the sleeping disorder symptoms and/or an index of a subject's symptoms measured during use of the PAP device and data of usage of the PAP device, a first radio frequency wireless transceiver, and a mask or a nasal cannula". The Applicants believe it is clear from the claim language as to which components are being used to perform these claim functions to one skilled in the art and as such these claims are not limited as a means plus function.

Claim Rejections – 35 U.S.C. § 112

Claims 1-6, 8-13, and 15-22 were rejected under 112(a) or 35 U.S.C. 112 (pre-AIA), first paragraph, as failing to comply with the written description requirement. The Examiner is concerned that the Applicants are claiming two PAP devices for treating the subject with devices 1 and 2. The Applicants traverse and believe the claims as amended reflect that the devices or components or 1 and 2 are clear part of a "single enclosure" or PAP device, the PAP device these features. Given the amendments and further explanation the Applicants urge the Examiner to withdraw this rejection.

Claims 1-6, 8-13, and 15-22 were rejected under 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor regards as the invention. The Applicants thank the Examiner for his helpful suggestions and submit that the claims as now amended clarify the previous limitations.

Claim Rejections – 35 U.S.C. § 102

This rejection is now moot given the amendments to the claims.

Claim Rejections – 35 U.S.C. § 103

This rejection is now moot given the amendments to the claims.

CONCLUSION:

The Applicant respectfully submits that this application is in condition for allowance and that action is earnestly solicited.

Respectfully submitted,

4/20/2022
Dated

/Brian M. Kolkowski/

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Electronic Acknowledgement Receipt

EFS ID:	45514323
Application Number:	16057963
International Application Number:	
Confirmation Number:	1595
Title of Invention:	Devices and Methods for Sleep Disorder Diagnosis and Treatment
First Named Inventor/Applicant Name:	Hani Kayyali
Customer Number:	81177
Filer:	Brian M. Kolkowski/Mark Pennington
Filer Authorized By:	Brian M. Kolkowski
Attorney Docket Number:	CMD-105
Receipt Date:	20-APR-2022
Filing Date:	08-AUG-2018
Time Stamp:	10:28:13
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		CMD-105_20Apr2022_amendment.pdf	171826 207c7b63b8f1e0c1170a2bd7dc37803d3d70a26c	yes	12

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Response After Final Action	1	1
	Claims	2	9
	Applicant Arguments/Remarks Made in an Amendment	10	12
Warnings:			
Information:			
	Total Files Size (in bytes):	171826	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 16/057,963	Filing Date 08/08/2018	☐ To be Mailed

ENTITY: ☐ LARGE ☑ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $50 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $230 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	04/20/2022	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 16	Minus	** 20	= 0		x $50 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0		x $240 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	ADMIN
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/KREIGHTON LAMBERT SR/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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NOTICE OF ALLOWANCE AND FEE(S) DUE

81177 7590 05/23/2022

Cleveland Medical Devices Inc.
4415 Euclid Ave. Ste. 500
Cleveland, OH 44103

EXAMINER
NATNITHITHADHA, NAVIN

ART UNIT	PAPER NUMBER
3791	

DATE MAILED: 05/23/2022

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/057,963	08/08/2018	Hani Kayyali	CMD-105	1595

TITLE OF INVENTION: Devices and Methods for Sleep Disorder Diagnosis and Treatment

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$600	$0.00	$0.00	$600	08/23/2022

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

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Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

81177 7590 05/23/2022
Cleveland Medical Devices Inc.
4415 Euclid Ave. Ste. 500
Cleveland, OH 44103

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

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I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/057,963	08/08/2018	Hani Kayyali	CMD-105	1595

TITLE OF INVENTION: Devices and Methods for Sleep Disorder Diagnosis and Treatment

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$600	$0.00	$0.00	$600	08/23/2022

EXAMINER	ART UNIT	CLASS-SUBCLASS
NATNITHITHADHA, NAVIN	3791	600-544000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/AIA/122 or PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. Fees submitted: ❑Issue Fee ❑Publication Fee (if required) ❑Advance Order - # of Copies _____

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

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❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29

❑ Applicant asserting small entity status. See 37 CFR 1.27

❑ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

ResMed Corp. - Ex. 1002
Page 220

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/057,963	08/08/2018	Hani Kayyali	CMD-105	1595

81177 7590 05/23/2022

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4415 Euclid Ave. Ste. 500
Cleveland, OH 44103

EXAMINER	
NATNITHITHADHA, NAVIN	
ART UNIT	PAPER NUMBER
3791	

DATE MAILED: 05/23/2022

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 16/057,963	Applicant(s) Kayyali et al.	
	Examiner NAVIN NATNITHITHADHA	Art Unit 3791	AIA (FITF) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to the Amendment and Remarks, filed 20 April 2022.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☑ The allowed claim(s) is/are See Continuation Sheet . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some* c) ☐ None of the:

   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☑ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☑ Examiner's Amendment/Comment
6. ☑ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/NAVIN NATNITHITHADHA/
Primary Examiner, Art Unit 3791

Continuation of 3. The allowed claim(s) is/are: 2-6,8-13,15-17 and 21-22

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application is being examined under the pre-AIA first to invent provisions.

Examiner's Amendment

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Brian M. Kolkowski on 19 May 2022.

The application has been amended as follows:

The claims have been amended as follows:

- -

4. (currently amended) A sleeping disorder treatment system comprising:

a PAP device configured to be a single enclosure, the PAP device comprising:

a blower having an air output;

an airflow sensor internal to the PAP device and adapted for measuring the respiratory airflow of a subject while using the PAP device;

a first processor adapted for generating and outputting the data related to the subject's treatment and the treatment's efficacy by receiving sensor data from the airflow sensor, and calculating both the quantified symptom data of the severity of the sleeping disorder symptoms and/or an index of a subject's

symptoms measured during use of the PAP device, and data of usage of the PAP device;

a first radio frequency wireless transceiver;

a mask or a nasal cannula;

~~a first device or group of components~~ wherein the airflow sensor and the first processor are adapted for measuring and calculating a data of a quantitative output of the severity of a subject's sleeping disorder symptoms during a treatment and further providing for a data related the subject's treatment and the treatment's efficacy;

~~a second device or group of components~~ wherein the blower, and the mask or the nasal cannula are adapted for physically or chemically treating a subject's sleeping disorder symptoms,

wherein ~~the first device or group of components can be used~~ the first processor is configured to adjust or re-adjust the ~~second device or group of components~~ blower using, in part, the data of the quantitative output of the level of severity of the subject's sleeping disorder symptoms during treatment;

~~wherein the first and second devices or groups of components together being part of a single enclosure, single PAP device, the PAP device comprising:~~

~~a blower having an air output,~~

~~an airflow sensor internal to the PAP device adapted for measuring the respiratory airflow of a subject while using the PAP device,~~

~~a first processor adapted for generating and outputting the data related to the subject's treatment and the treatment's efficacy by receiving sensor data from~~

~~the airflow sensor, and calculating both the quantified symptom data of the severity of the sleeping disorder symptoms and/or an index of a subject's symptoms measured during use of the PAP device, and data of usage of the PAP device,~~

~~a first radio frequency wireless transceiver, and~~

~~a mask or a nasal cannula;~~

a software stored on a non-transitory computer readable medium and executable by a second processor, the software adapted to be used with and to display the data related to the subject's treatment and the treatment's efficacy to the subject or a care provider by using a base station, a cell phone or a PDA, each comprising a second radio frequency wireless transceiver, the second processor and a display; and

a remote internet site, the remote internet site adapted to receive the data relate to the subject's treatment and the treatment's efficacy, in whole or part, generated by the PAP device and transmitted via the first radio frequency wireless transceiver,

wherein the software is further adapted to retransmit a data related to the subject's treatment and the treatment's efficacy received by the software from the first radio frequency wireless transceiver of the PAP device, in whole or part, to the remote internet site[[;]]. and

wherein the sensor data from the sensors is processed by the first processor using one or more of the signal processing techniques from the group consisting of a standard deviation technique, a recursively fit

ARMAX system identification model, a short-time fourier transform technique, a time-frequency signal analysis with a variety of different kernals, and a wavelet analysis.

5. (currently amended) A sleeping disorder treatment system comprising:

a PAP device configured to be a single enclosure, the PAP device comprising:

a blower having an air output;

an airflow sensor internal to the PAP device and adapted for measuring the respiratory airflow of a subject while using the PAP device;

a first processor adapted for generating and outputting the data related to the subject's treatment and the treatment's efficacy by receiving sensor data from the airflow sensor, and calculating both the quantified symptom data of the severity of the sleeping disorder symptoms and/or an index of a subject's symptoms measured during use of the PAP device, and data of usage of the PAP device;

a first radio frequency wireless transceiver;

a mask or a nasal cannula;

~~a first device or group of components~~ wherein the airflow sensor and the first processor are adapted for measuring and calculating a data of a quantitative output of the severity of a subject's sleeping disorder symptoms during a treatment and further providing for a data related the subject's treatment and the treatment's efficacy;

~~a second device or group of components~~ wherein the blower, and the mask or the nasal cannula are adapted for physically or chemically treating a subject's sleeping disorder symptoms,

wherein the ~~first device or group of components can be used~~ first processor is configured to adjust or re-adjust the ~~second device or group of components~~ blower using, in part, the data of the quantitative output of the level of severity of the subject's sleeping disorder symptoms during treatment;

~~wherein the first and second devices or groups of components together being part of a single enclosure, single PAP device, the PAP device comprising:~~

~~a blower having an air output,~~

~~an airflow sensor internal to the PAP device adapted for measuring the respiratory airflow of a subject while using the PAP device,~~

~~a first processor adapted for generating and outputting the data related to the subject's treatment and the treatment's efficacy by receiving sensor data from the airflow sensor, and calculating both the quantified symptom data of the severity of the sleeping disorder symptoms and/or an index of a subject's symptoms measured during use of the PAP device, and data of usage of the PAP device,~~

~~a first radio frequency wireless transceiver, and~~

~~a mask or a nasal cannula;~~

a software stored on a non-transitory computer readable medium and executable by a second processor, the software adapted to be used with and to display the data related to the subject's treatment and the treatment's efficacy to

the subject or a care provider by using a base station, a cell phone or a PDA, each comprising a second radio frequency wireless transceiver, the second processor and a display; and

a remote internet site, the remote internet site adapted to receive the data related to the subject's treatment and the treatment's efficacy, in whole or part, generated by the PAP device and transmitted via the first radio frequency wireless transceiver,

wherein the software is further adapted to receive, in whole or part, the data related to the subject's treatment and the treatment's efficacy generated by the PAP device that is first received by then retransmitted from the remote internet site[[;]], and

wherein the sensor data from the sensors is processed by the first processor using one or more of the signal processing techniques from the group consisting of a standard deviation technique, a recursively fit ARMAX system identification model, a short-time fourier transform technique, a time-frequency signal analysis with a variety of different kernals, and a wavelet analysis.

6. (currently amended) A sleeping disorder treatment system comprising:

a PAP device configured to be a single enclosure, the PAP device comprising:

a blower having an air output;

an airflow sensor internal to the PAP device and adapted for measuring the respiratory airflow of a subject while using the PAP device;

a first processor adapted for generating and outputting the data related to the subject's treatment and the treatment's efficacy by receiving sensor data from the airflow sensor, and calculating both the quantified symptom data of the severity of the sleeping disorder symptoms and/or an index of a subject's symptoms measured during use of the PAP device, and data of usage of the PAP device;

a first radio frequency wireless transceiver;

a mask or a nasal cannula;

~~a first device or group of components~~ wherein the airflow sensor and the first processor are adapted for measuring and calculating a
data of a quantitative output of the severity of a subject's sleeping disorder symptoms during a treatment and further providing for a data related the subject's treatment and the treatment's efficacy;

~~a second device or group of components~~ wherein the blower, and the mask or the nasal cannula are adapted for physically or chemically treating a subject's sleeping disorder symptoms,

wherein ~~the first device or group of components can be used~~ the first processor is configured to adjust or re-adjust the ~~second device or group of components~~ blower using, in part, the data of the quantitative output of the level of severity of the subject's sleeping disorder symptoms during treatment;

~~wherein the first and second devices or groups of components together being part of a single enclosure, single PAP device, the PAP device comprising:~~

~~a blower having an air output,~~

~~an airflow sensor internal to the PAP device adapted for measuring the respiratory airflow of a subject while using the PAP device,~~

~~a first processor adapted for generating and outputting the data related to the subject's treatment and the treatment's efficacy by receiving sensor data from the airflow sensor, and calculating both the quantified symptom data of the severity of the sleeping disorder symptoms and/or an index of a subject's symptoms measured during use of the PAP device, and data of usage of the PAP device,~~

~~a first radio frequency wireless transceiver, and~~

~~a mask or a nasal cannula;~~

a software stored on a non-transitory computer readable medium and executable by a second processor, the software adapted to be used with and to display the data related to the subject's treatment and the treatment's efficacy to the subject or a care provider by using a base station, a cell phone or a PDA, each comprising a second radio frequency wireless transceiver, the second processor and a display; and

a remote internet site, the remote internet site adapted to receive the data related to the subject's treatment and the treatment's efficacy, in whole or part, generated by the PAP device and transmitted via the first radio frequency wireless transceiver,

wherein both the software and the remote internet site

independently receive, in whole or part, the data related to the subject's

treatment and the treatment's efficacy generated by the PAP device[[;]]. and

wherein the sensor data from the sensors is processed by the first processor using one or more of the signal processing techniques from the group consisting of a standard deviation technique, a recursively fit ARMAX system identification model, a short-time fourier transform technique, a time-frequency signal analysis with a variety of different kernals, and a wavelet analysis.

- -

Response to Amendment

3. According to the Amendment, filed 20 April 2022, the status of the claims is as follows:

Claims 2-6, 8-10, 15-17, 21, and 22 are currently amended;

Claims 11-13 are previously presented; and

Claims 1, 7, 14, and 18-20 are cancelled.

4. The objections to claims 1-3, 6, and 18-20 are withdrawn in view of the Amendment, filed 20 April 2022.

5. The rejection of claims 1-6, 8-13, and 15-22 under 35 U.S.C. 101 because the claim(s) does/do not fall within at least one of the four categories of patent eligible subject matter, is withdrawn in view of the Amendment, filed 20 April 2022.

6. The rejection of claims 1-6, 8-13, and 15-22 under 35 U.S.C. 112(a) or 35 U.S.C. 112 (pre-AIA), first paragraph, as failing to comply with the written description requirement, is withdrawn in view of the Amendment, filed 20 April 2022.

7. The rejection of claims 1-6, 8-13, and 15-22 under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor (or for applications subject to pre-AIA 35 U.S.C. 112, the applicant), regards as the invention, is withdrawn in view of the Amendment, filed 20 April 2022.

8. The rejection of claims 1-6, 8-13, and 15-22 under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor (or for applications subject to pre-AIA 35 U.S.C. 112, the applicant), regards as the invention, is withdrawn in view of the Amendment, filed 20 April 2022.

9. The rejection of claims 1-6, 8-13, and 15-22 under pre-AIA 35 U.S.C. 102(e) as being anticipated by Farrell et al., U.S. Patent Application Publication No. 2007/0161913 A1 ("Farrell"), and the rejection of claims 8-10 under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Farrell, as applied to claims 4, 6, and 5, respectively, above, and further in view of Hedner et al., U.S. Patent Application Publication No. 2008/0257349 A1 ("Hedner"), are withdrawn in view of the Amendment, filed 20 April 2022. In the prior Office Action, pp. 29-30, mailed 21 January 2022, Claims 18-20 were indicated as allowable if rewritten in independent form including all of the limitations of the base claim, and if rewritten to overcome the rejection(s) under 35 U.S.C. 112. Applicant amended claims 4-6 into independent claims and included the allowable subject matter

of claims 18-20, respectively. Thus, claims 2-6, 8-13,15-17, 21, and 22, are allowable for the reasons stated in the prior Office Action.

Allowable Subject Matter

10. Claims 2-6, 8-13,15-17, 21, and 22 are allowed.

11. The following is a statement of reasons for the indication of allowable subject matter:

As to Claims 2-6, 8-13,15-17, 21, and 22, Farrell teaches the subject matter of claims 4-6, as discussed above. However, neither Farrell, Chervin, Tsukashima, nor the prior art of record teaches the sleeping disorder treatment system of base claims 4-6, including the following, in combination with all other limitations of the base claims:

> wherein the sensor data form the sensors is processed using one or more of the signal processing techniques from the group consisting of a standard deviation technique, a recursively fit ARMAX system identification model, a short-time fourier transform technique, a time-frequency signal analysis with a variety of different kernals, and a wavelet analysis.

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NAVIN NATNITHITHADHA whose telephone number is (571)272-4732. The examiner can normally be reached on Monday - Friday 6:00 am - 8:30 am & 10:30 am - 4:00 pm.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason M Sims can be reached on 571-272-7540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see https://ppair-my.uspto.gov/pair/PrivatePair. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/NAVIN NATNITHITHADHA/
Primary Examiner, Art Unit 3791
05/19/2022

Examiner-Initiated Interview Summary	**Application No.** 16/057,963	**Applicant(s)** Kayyali et al.		
	Examiner NAVIN NATNITHITHADHA	**Art Unit** 3791	**AIA (First Inventor to File) Status** No	**Page** 1 of 1

All Participants (applicant, applicants representative, PTO personnel)	**Title**	**Type**
NAVIN NATNITHITHADHA	Primary Examiner	Telephonic
Brian Kolkowski	Attorney	

Date of Interview: 19 May 2022

Issues Discussed:

Objections

Examiner objected to minor informalities, which included grammatical errors and lack of clarity of certain limitations, in the independent claims 4-6.

Proposed Amendment(s)

Examiner and Attorney discussed proposed amendment to the claim.
Examiner will incorporate the proposed amendment into an Examiner's Amendment with a Notice of Allowance.

/NAVIN NATNITHITHADHA/ Primary Examiner, Art Unit 3791	

Applicant is reminded that a complete written statement as to the substance of the interview must be made of record in the application file. It is the applicants responsibility to provide the written statement, unless the interview was initiated by the Examiner and the Examiner has indicated that a written summary will be provided. See MPEP 713.04
Please further see:
MPEP 713.04
Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews, paragraph (b)
37 CFR § 1.2 Business to be transacted in writing

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/057,963	Kayyali et al.
	Examiner	**Art Unit**
	NAVIN NATNITHITHADHA	3791

CPC								
Symbol							**Type**	**Version**
A61B	/	5	/	085			F	2013-01-01
A61B	/	5	/	4815			I	2013-01-01
A61M	/	2230	/	60			A	2013-01-01
A61M	/	2230	/	10			A	2013-01-01
A61B	/	5	/	02055			A	2013-01-01
A61M	/	2230	/	205			A	2013-01-01
A61M	/	2205	/	3584			A	2013-01-01
A61M	/	2016	/	0039			A	2013-01-01
A61M	/	2016	/	0027			A	2013-01-01
A61M	/	2230	/	202			A	2013-01-01
A61M	/	2205	/	3553			A	2013-01-01
A61M	/	16	/	0051			A	2013-01-01
A61M	/	2205	/	3592			A	2013-01-01
A61M	/	2205	/	3561			A	2013-01-01
A61M	/	2202	/	0208			A	2013-01-01
A61M	/	2230	/	04			A	2013-01-01
A61M	/	2230	/	14			A	2013-01-01
A61M	/	16	/	0069			A	2014-02-04

CPC Combination Sets								
Symbol					**Type**	**Set**	**Ranking**	**Version**
	/		/					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	16	
/NAVIN NATNITHITHADHA/ Primary Examiner, Art Unit 3791	19 May 2022	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	7

U.S. Patent and Trademark Office — Part of Paper No.: 20220523

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Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/057,963	Kayyali et al.
	Examiner	**Art Unit**
	NAVIN NATNITHITHADHA	3791

INTERNATIONAL CLASSIFICATION				
CLAIMED				
A61B	/	5	/	085
A61B	/	5	/	0205

NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**

CROSS REFERENCES(S)						
CLASS	**SUBCLASS (ONE SUBCLASS PER BLOCK)**					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	16	
/NAVIN NATNITHITHADHA/ Primary Examiner, Art Unit 3791	19 May 2022	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	7

U.S. Patent and Trademark Office

Part of Paper No.: 20220523

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/057,963	Kayyali et al.
	Examiner	**Art Unit**
	NAVIN NATNITHITHADHA	3791

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	1	8	10		19										
2	2	5	11		20										
3	3	9	12	11	21										
1	4	14	13	16	22										
7	5		14												
12	6	6	15												
	7	10	16												
4	8	15	17												
13	9		18												

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	16	
/NAVIN NATNITHITHADHA/ Primary Examiner, Art Unit 3791	19 May 2022	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	7

U.S. Patent and Trademark Office

Part of Paper No.: 20220523

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/057,963	Kayyali et al.
	Examiner	Art Unit
	NAVIN NATNITHITHADHA	3791

CPC - Searched*		
Symbol	**Date**	**Examiner**
A61B5/085 or A61M16/026 or A61M16/0069 or A61B5/02055 or A61B5/4815 or A61M16/0051 or A61M2205/3553 or A61M2205/3561 or A61M2205/3584 or A61M2205/3592 or A61M2016/0027 or A61M2016/0039 or A61M2202/0208 or A61M2230/04 or A61M2230/10 or A61M2230/14 or A61M2230/202 or A61M2230/205 or A61M2230/60	02/11/2021	/NN/
A61B5/085 or A61M16/026 or A61M16/0069 or A61B5/02055 or A61B5/4815 or A61M16/0051 or A61M2205/3553 or A61M2205/3561 or A61M2205/3584 or A61M2205/3592 or A61M2016/0027 or A61M2016/0039 or A61M2202/0208 or A61M2230/04 or A61M2230/10 or A61M2230/14 or A61M2230/202 or A61M2230/205 or A61M2230/60	01/14/2022	/NN/
A61B5/085 or A61M16/026 or A61M16/0069 or A61B5/02055 or A61B5/4815 or A61M16/0051 or A61M2205/3553 or A61M2205/3561 or A61M2205/3584 or A61M2205/3592 or A61M2016/0027 or A61M2016/0039 or A61M2202/0208 or A61M2230/04 or A61M2230/10 or A61M2230/14 or A61M2230/202 or A61M2230/205 or A61M2230/60	05/18/2022	/NN/

CPC Combination Sets - Searched*		
Symbol	**Date**	**Examiner**

US Classification - Searched*			
Class	**Subclass**	**Date**	**Examiner**
600	484,529-543	02/11/2021	/NN/
600	484,529-543	01/14/2022	/NN/
600	484,529-543	05/18/2022	/NN/

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

/N.N/ Primary Examiner, Art Unit 3791	

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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/057,963	Kayyali et al.
	Examiner	Art Unit
	NAVIN NATNITHITHADHA	3791

Search Notes		
Search Notes	**Date**	**Examiner**
EAST (attached): USPAT, US-PGPUB, EPO, JPO, Derwent, Keyword, Forward/Backward Citation, Assignee, Inventor, USPC, CPC searches	02/11/2021	/NN/
EAST (attached): USPAT, US-PGPUB, EPO, JPO, Derwent, Keyword, Forward/Backward Citation, Assignee, Inventor, Art of Record, USPC, CPC searches	01/14/2022	/NN/
SEARCH (updated search): USPAT, US-PGPUB, EPO, JPO, Derwent, Keyword, Forward/Backward Citation, Assignee, Inventor, Art of Record, Interference, USPC, CPC searches	05/18/2022	/NN/

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**
	A61B5/085 or A61M16/026 or A61M16/0069 or A61B5/02055 or A61B5/4815 or A61M16/0051 or A61M2205/3553 or A61M2205/3561 or A61M2205/3584 or A61M2205/3592 or A61M2016/0027 or A61M2016/0039 or A61M2202/0208 or A61M2230/04 or A61M2230/10 or A61M2230/14 or A61M2230/202 or A61M2230/205 or A61M2230/60	05/18/2022	/NN/

/N.N/ Primary Examiner, Art Unit 3791	

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OK TO ENTER: /N.N/

05/19/2022

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re:	Application of Kayyali et al.	)	
Serial No.:	16/057,963	)	Art Unit: 3791
Filed:	August 8, 2018	)	
For:	Devices and Methods for Sleep Disorder Diagnosis and Treatment	)	Attorney Docket No.: CMD-105
Examiner:	Navin Natnithithadha	)	

April 20, 2022

AMENDMENT AFTER FINAL

Commissioner of Patents and Trademarks
Alexandria, VA 22313-1450

Dear Sir/Mam:

This amendment is being filed in response to an Final Office Action dated January 21, 2022 with a due date of response of April 21, 2022. The Applicants believe no extension of time is needed but if this is not the case the Applicant contingently petition for an extension of time and authorize the USPTO to deduct any fees from their deposit account 502704. The following amendments to the specification and claims are respectfully submitted.

Bibliographic Data

Application No: 16/057,963

Foreign Priority claimed: ○ Yes ◉ No

35 USC 119 (a-d) conditions met: ☐ Yes ☑ No ☐ Met After Allowance

Verified and Acknowledged: /NAVIN NATNITHITHADHA/ Examiner's Signature | /NN/ Initials

Title: Devices and Methods for Sleep Disorder Diagnosis and Treatment

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
08/08/2018	600	3791	CMD-105
RULE			

APPLICANTS

INVENTORS

Hani Kayyali, Shaker Heights, OH, UNITED STATES

Robert Schmidt, Ft. Myers, FL, UNITED STATES

Mohammad Modarres-Zadeh, Tampa, FL, UNITED STATES

Brian Kolkowski, Leroy, OH, UNITED STATES

CONTINUING DATA

This application is a CON of 13440116 04/05/2012 PAT 10076269

13440116 is a CON of 11266899 11/04/2005 PAT 8172766

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

08/29/2018

**** SMALL ENTITY ****

STATE OR COUNTRY

UNITED STATES

ADDRESS

Cleveland Medical Devices Inc.
4415 Euclid Ave. Ste. 500
Cleveland, OH 44103
UNITED STATES

FILING FEE RECEIVED

$785

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S787	7,486	((KAYYALI NEAR2 HANI) OR (SCHMIDT NEAR2 ROBERT) OR ((("MODARRES-ZADEH") OR (MODARRES ADJ2 ZADEH)) NEAR2 MOHAMMAD) OR (KOLKOWSKI NEAR2 BRIAN)).INV.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2022/05/19 17:25
S788	1,608	("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) AND ("EEG" OR electroencephal$6 OR ((brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3))) AND ((sleep$3 NEAR8 (disorder OR illness OR condition OR obstructi$4)) OR apne$3 OR hypoapne$3 OR hyperapne$3 OR hypopne$3) AND (("600"/$) OR ("128"/$)).ccls.	US-PGPUB; USPAT	OR	ON	2022/05/19 17:25
S789	1,002	("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) AND (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3)) AND (((sleep$3 NEAR8 (disorder OR illness OR condition OR obstructi$4)) OR apne$3 OR hypoapne$3 OR hyperapne$3 OR hypopne$3) SAME (treat$5 OR therap$6)) AND (("600"/$) OR ("128"/$)).ccls.	US-PGPUB; USPAT	OR	ON	2022/05/19 17:25
S790	623	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) AND (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR	US-PGPUB; USPAT	OR	ON	2022/05/19 17:25

		brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3)) AND (((sleep$3 NEAR8 (disorder OR illness OR condition OR obstructi$4)) OR apne$3 OR hypoapne$3 OR hyperapne$3 OR hypopne$3) SAME (treat$5 OR therap$6)) AND (("600"/$) OR ("128"/$)).ccls.				
S791	131	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3))) AND (((sleep$3 NEAR8 (disorder OR illness OR condition OR obstructi$4)) OR apne$3 OR hypoapne$3 OR hyperapne$3 OR hypopne$3) SAME (treat$5 OR therap$6)) AND (("600"/$) OR ("128"/$)).ccls.	US-PGPUB; USPAT	OR	ON	2022/05/19 17:25
S792	131	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3))) AND S791	US-PGPUB; USPAT	OR	ON	2022/05/19 17:25
S793	141	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5	US-PGPUB; USPAT	OR	ON	2022/05/19 17:25

		OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3 OR signal$3 OR wave OR waveform OR data OR value))) AND (((sleep$3 NEAR8 (disorder OR illness OR condition OR obstructi$4)) OR apne$3 OR hypoapne$3 OR hyperapne$3 OR hypopne$3) SAME (treat$5 OR therap$6)) AND (("600"/$) OR ("128"/$)).ccls.				
S794	141	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3 OR signal$3 OR wave OR waveform OR data OR value))) AND S793	US-PGPUB; USPAT	OR	ON	2022/05/19 17:25
S795	5	("20050217674" | "5645043" | "6029664" | "6138675" | "6229581").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:26
S796	462	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3 OR signal$3 OR wave OR waveform OR data OR value))) AND (("600"/$) OR ("128"/$)).ccls.	US-PGPUB; USPAT	OR	ON	2022/05/19 17:26
S797	244	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR	US-PGPUB; USPAT	OR	ON	2022/05/19 17:26

		biometer$3 OR measur$5 OR monitor$3 OR signal$3 OR wave OR waveform OR data OR value))) AND ((sleep$3 NEAR8 (disorder OR illness OR condition OR obstructi$4)) OR apne$3 OR hypoapne$3 OR hyperapne$3 OR hypopne$3) AND (("600"/$) OR ("128"/$)).ccls.				
S798	244	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3 OR signal$3 OR wave OR waveform OR data OR value))) AND S797	US-PGPUB; USPAT	OR	ON	2022/05/19 17:26
S799	20	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$).did.	US-PGPUB; USPAT	OR	ON	2022/05/19 17:26
S800	0	(quantitative$3) AND (realtime OR (real ADJ2 time)) AND S799	US-PGPUB; USPAT	OR	ON	2022/05/19 17:26
S801	7	(realtime OR (real ADJ2 time)) AND S799	US-PGPUB; USPAT	OR	ON	2022/05/19 17:26
S802	4	(quantitative$3) AND S799	US-PGPUB; USPAT	OR	ON	2022/05/19 17:26
S803	5	("20050217674" | "5645043" | "6029664" | "6138675" | "6229581").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:26
S804	20	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-	US-PGPUB; USPAT	OR	ON	2022/05/19 17:26

		20050085738-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$).did.				
S805	15	S804 NOT S803	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:26
S806	184	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME (adjust$4 OR control$4 OR regulat$4 OR chang$3)) AND ((respir$6 OR breath$3 OR thorac$3 OR chest OR lung OR breast OR torso OR abdom$5) WITH (belt OR strap OR vest OR garment OR cloth$3)) AND ((pulse OR oximet$4 OR oxymet$4) WITH (sensor$3 OR sensing OR measur$6 OR detect$5 OR monitor$3 OR transducer OR probe)) AND (sleep$3 WITH (disorder OR condition OR disease OR illness OR apne$3 OR symptom)) AND ((600/529-543,484) OR ("128"/$)).ccls.	US-PGPUB; USPAT	OR	ON	2022/05/19 17:26
S807	184	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME (adjust$4 OR control$4 OR regulat$4 OR chang$3)) AND ((pulse OR oximet$4 OR oxymet$4) WITH (sensor$3 OR sensing OR measur$6 OR detect$5 OR monitor$3 OR transducer OR probe)) AND S806	US-PGPUB; USPAT	OR	ON	2022/05/19 17:27
S808	170	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) AND ((respir$6 OR breath$3 OR thorac$3 OR chest OR lung OR breast OR torso OR abdom$5) SAME (belt OR strap OR vest OR garment OR cloth$3)) AND ((pulse OR oximet$4 OR oxymet$4 OR saturation) WITH (sensor$3 OR sensing OR measur$6 OR detect$5 OR monitor$3 OR transducer OR probe)) AND (sleep$3 WITH (disorder OR condition OR disease OR illness OR apne$3 OR symptom)) AND ((600/529-543,484) OR ("128"/$)).ccls.	US-PGPUB; USPAT	OR	ON	2022/05/19 17:27

S809	170	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) AND ((pulse OR oximet$4 OR oxymet$4 OR saturation) WITH (sensor$3 OR sensing OR measur$6 OR detect$5 OR monitor$3 OR transducer OR probe)) AND (sleep$3 WITH (disorder OR condition OR disease OR illness OR apne$3 OR symptom)) AND S808	US-PGPUB; USPAT	OR	ON	2022/05/19 17:27
S810	1	(US-20050115561-$).did.	US-PGPUB	OR	ON	2022/05/19 17:27
S811	1	S810 AND ((respir$6 OR breath$3 OR thorac$3 OR chest OR lung OR breast OR torso OR abdom$5) SAME (belt OR strap OR vest OR garment OR cloth$3))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:27
S812	1	S810 AND ((respir$6 OR breath$3 OR thorac$3 OR chest OR lung OR breast OR torso OR abdom$5) WITH (sensor$3 OR sensing OR detector OR probe OR monitor OR transducer))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:28
S813	1	(US-20050115561-$).did.	US-PGPUB	OR	ON	2022/05/19 17:28
S814	1	S813 AND ((pulse OR oximet$4 OR oxymet$4 OR saturation) WITH (sensor$3 OR sensing OR measur$6 OR detect$5 OR monitor$3 OR transducer OR probe))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:28
S815	1	S813 AND (realtime OR (real ADJ2 time))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:28
S816	1	S813 AND (wireless$3 OR transmi$6 OR transceiver OR communicat$5)	US-PGPUB; USPAT	OR	ON	2022/05/19 17:28
S817	1	S813 AND (wireless$3)	US-PGPUB; USPAT	OR	ON	2022/05/19 17:28
S818	1	S813 AND ("EEG" OR electroenceph$ OR brain OR brainwave$5)	US-PGPUB; USPAT	OR	ON	2022/05/19 17:29
S819	1	S813 AND ("ECG" OR "EKG" OR electrocardiograph$)	US-PGPUB; USPAT	OR	ON	2022/05/19 17:29
S820	5	("20050217674" | "5645043" | "6029664" | "6138675" | "6229581").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:29
S821	35	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-	US-PGPUB; USPAT	OR	ON	2022/05/19 17:29

		20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$).did.				
S822	18	("20030000528" | "20040163648" | "20040254493" | "20050081847" | "20050165323" | "20050217674" | "20050268916" | "20050188991" | "20060247546" | "5645043" | "6029664" | "6138675" | "6229581" | "6431171" | "6889691" | "7190995" | "7204250" | "7575005").PN.	US-PGPUB; USPAT	OR	ON	2022/05/19 17:29
S823	18	S821 NOT S822	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:29
S824	27	("20030000528" | "20040163648" | "20040254493" | "20050081847" | "20050085738" | "20050115561" | "20050165323" | "20050217674" | "20050268916" | "20050188991" | "20060247546" | "5645043" | "5961447" | "6029664" | "6138675" | "6229581" | "6431171" | "6551252" | "6889691" | "7190995" | "7195013" | "7204250" | "7225809" | "7309314" | "7575005" | "7668579" | "7670295").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:29
S825	35	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-	US-PGPUB; USPAT	OR	ON	2022/05/19 17:29

		20070209662-$ or US-20040200474-$ or US-20050115561-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$).did.				
S826	36	S824 OR S825	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:29
S827	27	("20030000528" | "20040163648" | "20040254493" | "20050081847" | "20050085738" | "20050115561" | "20050165323" | "20050217674" | "20050268916" | "20050188991" | "20060247546" | "5645043" | "5961447" | "6029664" | "6138675" | "6229581" | "6431171" | "6551252" | "6889691" | "7190995" | "7195013" | "7204250" | "7225809" | "7309314" | "7575005" | "7668579" | "7670295").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:29
S828	35	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$).did.	US-PGPUB; USPAT	OR	ON	2022/05/19 17:29
S829	36	S827 OR S828	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:29
S830	30	S829 AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:29

		AND ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) AND (pulse OR pulsewave$5 OR oximet$4 OR oxymet$4) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6) WITH (belt OR strap OR piezoelect$5 OR sensor$3 OR sensing OR transducer OR electrode OR detect$4 OR biosensor$3 OR biosensing OR biotransducer OR bioelectrode OR biodetect$4))				
S831	30	S830 AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6) WITH (belt OR strap OR piezoelect$5 OR sensor$3 OR sensing OR transducer OR electrode OR detect$4 OR biosensor$3 OR biosensing OR biotransducer OR bioelectrode OR biodetect$4))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:29
S832	704	(("600"/$) OR ("128"/$)).ccls. AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) AND (pulse OR pulsewave$5 OR oximet$4 OR oxymet$4) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6) SAME (belt OR strap OR piezoelect$5))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:29
S833	644	(("600"/$) OR ("128"/$)).ccls. AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6) SAME (belt OR strap OR piezoelect$5))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:30

S834	354	(("600"/$) OR ("128"/$)).ccls. AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (movement OR moving OR motion OR expansion OR expand$3 OR compress$4) SAME (belt OR strap OR piezoelect$5))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:30
S835	354	S834 AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (movement OR moving OR motion OR expansion OR expand$3 OR compress$4) SAME (belt OR strap OR piezoelect$5))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:30
S836	172	(("600"/$) OR ("128"/$)).ccls. AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND (("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5)) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR	US-PGPUB; USPAT	OR	ON	2022/05/19 17:30

		biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (movement OR moving OR motion OR expansion OR expand$3 OR compress$4) SAME (belt OR strap OR piezoelect$5))				
S837	172	S836 AND (("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5)) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (movement OR moving OR motion OR expansion OR expand$3 OR compress$4) SAME (belt OR strap OR piezoelect$5))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:30
S838	31	(("600"/$) OR ("128"/$)).ccls. AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND ((("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5)) SAME (pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR saturation) SAME (respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (movement OR moving OR motion OR expansion OR expand$3 OR compress$4) SAME (belt OR strap OR piezoelect$5))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:30
S839	31	S838 AND ((("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5)) SAME (pulse OR pulsewave$5 OR	US-PGPUB; USPAT	OR	ON	2022/05/19 17:30

		oximet$4 OR oxymet$4 OR saturation) SAME (respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (movement OR moving OR motion OR expansion OR expand$3 OR compress$4) SAME (belt OR strap OR piezoelect$5))				
S840	13	S829 AND (("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5)) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR saturation) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (belt OR strap OR piezoelect$5))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:30
S841	413	(("600"/$) OR ("128"/$)).ccls. AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND (("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5)) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR saturation) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (belt OR strap OR piezoelect$5 OR vest OR band))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:30
S843	45	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-	US-PGPUB; USPAT	OR	ON	2022/05/19 17:30

		20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$).did.				
S844	26	((diagnosis OR diagnose OR diagnosing OR sever$6 OR evaluat$5 OR output$5) WITH sleep$4 WITH (disorder OR symptoms OR abnormal$5 OR illness OR apnea OR apneic OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND S843	US-PGPUB; USPAT	OR	ON	2022/05/19 17:31
S845	37	(transmi$6 OR transceiv$5 OR wireless$3 OR radio OR radiofrequenc$3 OR antenna OR telemet$4) AND S843	US-PGPUB; USPAT	OR	ON	2022/05/19 17:31
S846	18	((transmi$6 OR transceiv$5 OR wireless$3 OR radio OR radiofrequenc$3 OR antenna OR telemet$4) SAME ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator)) AND S843	US-PGPUB; USPAT	OR	ON	2022/05/19 17:31
S847	1,007	(("600"/$) OR ("128"/$)).ccls. AND ((transmi$6 OR transceiv$5 OR wireless$3 OR radio OR radiofrequenc$3 OR antenna OR telemet$4) SAME ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator)) AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4	US-PGPUB; USPAT	OR	ON	2022/05/19 17:31

		OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND (adjust$6 OR regulat$5 OR control$5 OR set$5)				
S848	302	(("600"/$) OR ("128"/$)).ccls. AND ((transmi$6 OR transceiv$5 OR wireless$3 OR radio OR radiofrequenc$3 OR antenna OR telemet$4) SAME ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator)) AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND (adjust$6 OR regulat$5 OR control$5 OR set$5)AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR saturation) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (belt OR strap OR piezoelect$5 OR vest OR band))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:31
S849	302	(("600"/$) OR ("128"/$)).ccls. AND ((transmi$6 OR transceiv$5 OR wireless$3 OR radio OR radiofrequenc$3 OR antenna OR telemet$4) SAME ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator)) AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND (adjust$6 OR regulat$5 OR control$5 OR set$5) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR saturation) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME	US-PGPUB; USPAT	OR	ON	2022/05/19 17:31

		(belt OR strap OR piezoelect$5 OR vest OR band))				
S850	302	S849 AND ((transmi$6 OR transceiv$5 OR wireless$3 OR radio OR radiofrequenc$3 OR antenna OR telemet$4) SAME ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (belt OR strap OR piezoelect$5 OR vest OR band))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:31
S851	302	S849 AND ((transmi$6 OR transceiv$5 OR wireless$3 OR radio OR radiofrequenc$3 OR antenna OR telemet$4) SAME ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:32
S852	435	(("600"/$) OR ("128"/$)).ccls. AND (("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5)) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (belt OR strap OR piezoelect$5))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:32
S853	684	(("600"/$) OR ("128"/$)).ccls. AND (("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5)) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR saturation) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND	US-PGPUB; USPAT	OR	ON	2022/05/19 17:32

		((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (belt OR strap OR piezoelect$5 OR vest OR band))				
S854	684	S853 AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR saturation) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (belt OR strap OR piezoelect$5 OR vest OR band))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:32
S855	1	("20020185130").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:32
S856	27	("20030000528" | "20040163648" | "20040254493" | "20050081847" | "20050085738" | "20050115561" | "20050165323" | "20050217674" | "20050268916" | "20050188991" | "20060247546" | "5645043" | "5961447" | "6029664" | "6138675" | "6229581" | "6431171" | "6551252" | "6889691" | "7190995" | "7195013" | "7204250" | "7225809" | "7309314" | "7575005" | "7668579" | "7670295").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:32
S857	15	((jonathan NEAR2 wright) OR (anthony NEAR2 ujhazy)).inv. AND CPAP AND pulse AND (respiratory ADJ2 movement)	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:32
S858	15	S857 AND (sleep$3 WITH (disorder OR symptom OR condition OR illness))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:32
S859	0	S857 AND (realtime OR (real ADJ2 time))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:32
S860	15	S857 AND (nebuliz$3 OR medication OR medicine OR drug OR agent)	US-PGPUB; USPAT	OR	ON	2022/05/19 17:32
S861	50	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$	US-PGPUB; USPAT	OR	ON	2022/05/19 17:33

		or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-20100258126-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$ or US-7662101-$ or US-7878198-$).did.				
S862	24	S861 NOT S856	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:33
S863	50	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-20100258126-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-	US-PGPUB; USPAT	OR	ON	2022/05/19 17:33

		7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$ or US-7662101-$ or US-7878198-$).did.				
S864	34	("20020185130" | "20030000528" | "20040138576" | "20040163648" | "20040254493" | "20050081847" | "20050085738" | "20050115561" | "20050165323" | "20050217674" | "20050268916" | "20050188991" | "20060084877" | "20060247546" | "5645043" | "5961447" | "6029664" | "6138675" | "6229581" | "6431171" | "6551252" | "6832609" | "6889691" | "7018341" | "7190995" | "7195013" | "7204250" | "7225809" | "7309314" | "7575005" | "7662101" | "7668579" | "7670295" | "7878198").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:33
S865	51	S863 OR S864	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:33
S866	31	((severit$4 OR level OR depth OR stag$3) WITH (apne$4 OR hypopne$5 OR hypoapne$5 OR hyperapne$5)) AND S865	US-PGPUB; USPAT	OR	ON	2022/05/19 17:33
S867	31	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (signal$3 OR data OR sens$5 OR information OR parameter)) AND (apne$4 OR hypopne$5 OR hypoapne$5 OR hyperapne$5) AND S865	US-PGPUB; USPAT	OR	ON	2022/05/19 17:33
S868	31	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (signal$3 OR data OR sens$5 OR information OR parameter)) AND S867	US-PGPUB; USPAT	OR	ON	2022/05/19 17:33
S869	9	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (signal$3 OR data OR sens$5 OR information OR parameter)) AND ((apne$4 OR hypopne$5 OR hypoapne$5 OR hyperapne$5) WITH (index OR indices)) AND S865	US-PGPUB; USPAT	OR	ON	2022/05/19 17:33
S870	6	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4	US-PGPUB; USPAT	OR	ON	2022/05/19 17:33

		OR respirator) SAME ((radio OR radiofrequenc$3 OR "RF" OR wireless$3) WITH (transmi$6 OR transceiv$3 OR telemet$5 OR communicat$5 OR receiv$3 OR antenna))) AND S865				
S871	0	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME ((radio OR radiofrequenc$3 OR "RF" OR wireless$3) WITH (transmi$6 OR transceiv$3 OR telemet$5 OR communicat$5 OR receiv$3 OR antenna)) SAME acquistion) AND (600/484,529-543).ccls.	US-PGPUB; USPAT	OR	ON	2022/05/19 17:34
S872	181	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME ((radio OR radiofrequenc$3 OR "RF" OR wireless$3) WITH (transmi$6 OR transceiv$3 OR telemet$5 OR communicat$5 OR receiv$3 OR antenna))) AND (apne$4 OR hypopne$5 OR hypoapne$5 OR hyperapne$5) AND ((600/484,529-543) OR (128/204.21-204.26)).ccls.	US-PGPUB; USPAT	OR	ON	2022/05/19 17:34
S873	181	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME ((radio OR radiofrequenc$3 OR "RF" OR wireless$3) WITH (transmi$6 OR transceiv$3 OR telemet$5 OR communicat$5 OR receiv$3 OR antenna))) AND S872	US-PGPUB; USPAT	OR	ON	2022/05/19 17:34
S874	7,486	((KAYYALI NEAR2 HANI) OR (SCHMIDT NEAR2 ROBERT) OR ((("MODARRES-ZADEH") OR (MODARRES ADJ2 ZADEH)) NEAR2 MOHAMMAD) OR (KOLKOWSKI NEAR2 BRIAN)).INV.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2022/05/19 17:34
S875	1,608	("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) AND ("EEG" OR electroencephal$6 OR ((brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3))) AND ((sleep$3 NEAR8	US-PGPUB; USPAT	OR	ON	2022/05/19 17:34

		(disorder OR illness OR condition OR obstructi$4)) OR apne$3 OR hypoapne$3 OR hyperapne$3 OR hypopne$3) AND (("600"/$) OR ("128"/$)).ccls.				
S876	1,002	("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) AND (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3)) AND (((sleep$3 NEAR8 (disorder OR illness OR condition OR obstructi$4)) OR apne$3 OR hypoapne$3 OR hyperapne$3 OR hypopne$3) SAME (treat$5 OR therap$6)) AND (("600"/$) OR ("128"/$)).ccls.	US-PGPUB; USPAT	OR	ON	2022/05/19 17:34
S877	623	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) AND (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3)) AND (((sleep$3 NEAR8 (disorder OR illness OR condition OR obstructi$4)) OR apne$3 OR hypoapne$3 OR hyperapne$3 OR hypopne$3) SAME (treat$5 OR therap$6)) AND (("600"/$) OR ("128"/$)).ccls.	US-PGPUB; USPAT	OR	ON	2022/05/19 17:34
S878	131	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR	US-PGPUB; USPAT	OR	ON	2022/05/19 17:34

		monitor$3))) AND (((sleep$3 NEAR8 (disorder OR illness OR condition OR obstructi$4)) OR apne$3 OR hypoapne$3 OR hyperapne$3 OR hypopne$3) SAME (treat$5 OR therap$6)) AND (("600"/$) OR ("128"/$)).ccls.				
S879	131	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3))) AND S878	US-PGPUB; USPAT	OR	ON	2022/05/19 17:35
S880	141	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3 OR signal$3 OR wave OR waveform OR data OR value))) AND (((sleep$3 NEAR8 (disorder OR illness OR condition OR obstructi$4)) OR apne$3 OR hypoapne$3 OR hyperapne$3 OR hypopne$3) SAME (treat$5 OR therap$6)) AND (("600"/$) OR ("128"/$)).ccls.	US-PGPUB; USPAT	OR	ON	2022/05/19 17:35
S881	141	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3 OR signal$3 OR wave OR	US-PGPUB; USPAT	OR	ON	2022/05/19 17:35

		waveform OR data OR value))) AND S880				
S882	5	("20050217674" | "5645043" | "6029664" | "6138675" | "6229581").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:35
S883	462	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3 OR signal$3 OR wave OR waveform OR data OR value))) AND (("600"/$) OR ("128"/$)).ccls.	US-PGPUB; USPAT	OR	ON	2022/05/19 17:35
S884	244	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3 OR signal$3 OR wave OR waveform OR data OR value))) AND ((sleep$3 NEAR8 (disorder OR illness OR condition OR obstructi$4)) OR apne$3 OR hypoapne$3 OR hyperapne$3 OR hypopne$3) AND (("600"/$) OR ("128"/$)).ccls.	US-PGPUB; USPAT	OR	ON	2022/05/19 17:35
S885	244	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3 OR signal$3 OR wave OR waveform OR data OR value))) AND S884	US-PGPUB; USPAT	OR	ON	2022/05/19 17:35

S886	20	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$).did.	US-PGPUB; USPAT	OR	ON	2022/05/19 17:35
S887	0	(quantitative$3) AND (realtime OR (real ADJ2 time)) AND S886	US-PGPUB; USPAT	OR	ON	2022/05/19 17:35
S888	7	(realtime OR (real ADJ2 time)) AND S886	US-PGPUB; USPAT	OR	ON	2022/05/19 17:36
S889	4	(quantitative$3) AND S886	US-PGPUB; USPAT	OR	ON	2022/05/19 17:36
S890	5	("20050217674" | "5645043" | "6029664" | "6138675" | "6229581").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:36
S891	20	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$).did.	US-PGPUB; USPAT	OR	ON	2022/05/19 17:36
S892	15	S891 NOT S890	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:36
S893	184	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME (adjust$4 OR control$4 OR regulat$4 OR chang$3)) AND ((respir$6 OR breath$3 OR thorac$3 OR chest OR lung OR breast OR torso OR abdom$5) WITH (belt OR strap OR vest OR garment OR cloth$3)) AND ((pulse OR oximet$4 OR oxymet$4) WITH (sensor$3 OR sensing OR measur$6 OR detect$5 OR monitor$3 OR transducer OR probe)) AND (sleep$3 WITH (disorder OR condition OR disease OR illness OR apne$3 OR symptom)) AND	US-PGPUB; USPAT	OR	ON	2022/05/19 17:36

		((600/529-543,484) OR ("128"/$)).ccls.				
S894	184	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME (adjust$4 OR control$4 OR regulat$4 OR chang$3)) AND ((pulse OR oximet$4 OR oxymet$4) WITH (sensor$3 OR sensing OR measur$6 OR detect$5 OR monitor$3 OR transducer OR probe)) AND S893	US-PGPUB; USPAT	OR	ON	2022/05/19 17:36
S895	170	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) AND ((respir$6 OR breath$3 OR thorac$3 OR chest OR lung OR breast OR torso OR abdom$5) SAME (belt OR strap OR vest OR garment OR cloth$3)) AND ((pulse OR oximet$4 OR oxymet$4 OR saturation) WITH (sensor$3 OR sensing OR measur$6 OR detect$5 OR monitor$3 OR transducer OR probe)) AND (sleep$3 WITH (disorder OR condition OR disease OR illness OR apne$3 OR symptom)) AND ((600/529-543,484) OR ("128"/$)).ccls.	US-PGPUB; USPAT	OR	ON	2022/05/19 17:36
S896	170	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) AND ((pulse OR oximet$4 OR oxymet$4 OR saturation) WITH (sensor$3 OR sensing OR measur$6 OR detect$5 OR monitor$3 OR transducer OR probe)) AND (sleep$3 WITH (disorder OR condition OR disease OR illness OR apne$3 OR symptom)) AND S895	US-PGPUB; USPAT	OR	ON	2022/05/19 17:36
S897	1	(US-20050115561-$).did.	US-PGPUB	OR	ON	2022/05/19 17:36
S898	1	S897 AND ((respir$6 OR breath$3 OR thorac$3 OR chest OR lung OR breast OR torso OR abdom$5) SAME (belt OR strap OR vest OR garment OR cloth$3))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:36
S899	1	S897 AND ((respir$6 OR breath$3 OR thorac$3 OR chest OR lung OR breast OR torso OR abdom$5) WITH	US-PGPUB; USPAT	OR	ON	2022/05/19 17:37

		(sensor$3 OR sensing OR detector OR probe OR monitor OR transducer))				
S900	1	(US-20050115561-$).did.	US-PGPUB	OR	ON	2022/05/19 17:37
S901	1	S900 AND ((pulse OR oximet$4 OR oxymet$4 OR saturation) WITH (sensor$3 OR sensing OR measur$6 OR detect$5 OR monitor$3 OR transducer OR probe))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:37
S902	1	S900 AND (realtime OR (real ADJ2 time))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:37
S903	1	S900 AND (wireless$3 OR transmi$6 OR transceiver OR communicat$5)	US-PGPUB; USPAT	OR	ON	2022/05/19 17:37
S904	1	S900 AND (wireless$3)	US-PGPUB; USPAT	OR	ON	2022/05/19 17:37
S905	1	S900 AND ("EEG" OR electroenceph$ OR brain OR brainwave$5)	US-PGPUB; USPAT	OR	ON	2022/05/19 17:37
S906	1	S900 AND ("ECG" OR "EKG" OR electrocardiograph$)	US-PGPUB; USPAT	OR	ON	2022/05/19 17:38
S907	5	("20050217674" | "5645043" | "6029664" | "6138675" | "6229581").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:38
S908	35	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$).did.	US-PGPUB; USPAT	OR	ON	2022/05/19 17:38
S909	18	("20030000528" | "20040163648" | "20040254493" | "20050081847" | "20050165323" | "20050217674" | "20050268916" | "20050188991" | "20060247546" | "5645043" |	US-PGPUB; USPAT	OR	ON	2022/05/19 17:38

		"6029664" | "6138675" | "6229581" | "6431171" | "6889691" | "7190995" | "7204250" | "7575005").PN.				
S910	18	S908 NOT S909	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:38
S911	27	("20030000528" | "20040163648" | "20040254493" | "20050081847" | "20050085738" | "20050115561" | "20050165323" | "20050217674" | "20050268916" | "20050188991" | "20060247546" | "5645043" | "5961447" | "6029664" | "6138675" | "6229581" | "6431171" | "6551252" | "6889691" | "7190995" | "7195013" | "7204250" | "7225809" | "7309314" | "7575005" | "7668579" | "7670295").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:38
S912	35	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$).did.	US-PGPUB; USPAT	OR	ON	2022/05/19 17:38
S913	36	S911 OR S912	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:38
S914	27	("20030000528" | "20040163648" | "20040254493" | "20050081847" | "20050085738" | "20050115561" | "20050165323" | "20050217674" | "20050268916" | "20050188991" | "20060247546" | "5645043" | "5961447" | "6029664" | "6138675" | "6229581" | "6431171" | "6551252" | "6889691" | "7190995" | "7195013" | "7204250" | "7225809" | "7309314" |	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:38

		"7575005" | "7668579" | "7670295").PN.				
S915	35	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$).did.	US-PGPUB; USPAT	OR	ON	2022/05/19 17:38
S916	36	S914 OR S915	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:38
S917	30	S916 AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) AND (pulse OR pulsewave$5 OR oximet$4 OR oxymet$4) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6) WITH (belt OR strap OR piezoelect$5 OR sensor$3 OR sensing OR transducer OR electrode OR detect$4 OR biosensor$3 OR biosensing OR biotransducer OR bioelectrode OR biodetect$4))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:38
S918	30	S917 AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6) WITH (belt OR strap OR piezoelect$5 OR sensor$3 OR sensing OR transducer OR electrode OR detect$4 OR biosensor$3 OR biosensing OR biotransducer OR bioelectrode OR biodetect$4))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:39
S919	704	(("600"/$) OR ("128"/$)).ccls. AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR	US-PGPUB; USPAT	OR	ON	2022/05/19 17:39

		hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) AND (pulse OR pulsewave$5 OR oximet$4 OR oxymet$4) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6) SAME (belt OR strap OR piezoelect$5))				
S920	644	(("600"/$) OR ("128"/$)).ccls. AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6) SAME (belt OR strap OR piezoelect$5))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:39
S921	354	(("600"/$) OR ("128"/$)).ccls. AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (movement OR moving OR motion OR expansion OR expand$3 OR compress$4) SAME (belt OR strap OR piezoelect$5))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:39

S922	354	S921 AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (movement OR moving OR motion OR expansion OR expand$3 OR compress$4) SAME (belt OR strap OR piezoelect$5))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:39
S923	172	(("600"/$) OR ("128"/$)).ccls. AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND (("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5)) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (movement OR moving OR motion OR expansion OR expand$3 OR compress$4) SAME (belt OR strap OR piezoelect$5))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:39
S924	172	S923 AND (("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5)) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME	US-PGPUB; USPAT	OR	ON	2022/05/19 17:39

		(movement OR moving OR motion OR expansion OR expand$3 OR compress$4) SAME (belt OR strap OR piezoelect$5))				
S925	31	(("600"/$) OR ("128"/$)).ccls. AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND ((("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5)) SAME (pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR saturation) SAME (respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (movement OR moving OR motion OR expansion OR expand$3 OR compress$4) SAME (belt OR strap OR piezoelect$5))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:39
S926	31	S925 AND ((("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5)) SAME (pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR saturation) SAME (respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (movement OR moving OR motion OR expansion OR expand$3 OR compress$4) SAME (belt OR strap OR piezoelect$5))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:40
S927	13	S916 AND (("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5)) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR saturation) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR	US-PGPUB; USPAT	OR	ON	2022/05/19 17:40

		chest OR torso OR abdomen) SAME (belt OR strap OR piezoelect$5))				
S928	413	(("600"/$) OR ("128"/$)).ccls. AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND (("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5)) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR saturation) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (belt OR strap OR piezoelect$5 OR vest OR band))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:40
S929	413	S928 AND (("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5)) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR saturation) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (belt OR strap OR piezoelect$5 OR vest OR band))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:40
S930	45	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$	US-PGPUB; USPAT	OR	ON	2022/05/19 17:40

		or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$).did.				
S931	26	((diagnosis OR diagnose OR diagnosing OR sever$6 OR evaluat$5 OR output$5) WITH sleep$4 WITH (disorder OR symptoms OR abnormal$5 OR illness OR apnea OR apneic OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND S930	US-PGPUB; USPAT	OR	ON	2022/05/19 17:40
S932	37	(transmi$6 OR transceiv$5 OR wireless$3 OR radio OR radiofrequenc$3 OR antenna OR telemet$4) AND S930	US-PGPUB; USPAT	OR	ON	2022/05/19 17:40
S933	18	((transmi$6 OR transceiv$5 OR wireless$3 OR radio OR radiofrequenc$3 OR antenna OR telemet$4) SAME ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator)) AND S930	US-PGPUB; USPAT	OR	ON	2022/05/19 17:40
S934	1,007	(("600"/$) OR ("128"/$)).ccls. AND ((transmi$6 OR transceiv$5 OR wireless$3 OR radio OR radiofrequenc$3 OR antenna OR telemet$4) SAME ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator)) AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND (adjust$6 OR regulat$5 OR control$5 OR set$5)	US-PGPUB; USPAT	OR	ON	2022/05/19 17:41

S935	302	(("600"/$) OR ("128"/$)).ccls. AND ((transmi$6 OR transceiv$5 OR wireless$3 OR radio OR radiofrequenc$3 OR antenna OR telemet$4) SAME ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator)) AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND (adjust$6 OR regulat$5 OR control$5 OR set$5)AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR saturation) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (belt OR strap OR piezoelect$5 OR vest OR band))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:41
S936	302	(("600"/$) OR ("128"/$)).ccls. AND ((transmi$6 OR transceiv$5 OR wireless$3 OR radio OR radiofrequenc$3 OR antenna OR telemet$4) SAME ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator)) AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND (adjust$6 OR regulat$5 OR control$5 OR set$5) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR saturation) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (belt OR strap OR piezoelect$5 OR vest OR band))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:41
S937	302	S936 AND ((transmi$6 OR transceiv$5 OR wireless$3 OR radio OR	US-PGPUB; USPAT	OR	ON	2022/05/19 17:41

		radiofrequenc$3 OR antenna OR telemet$4) SAME ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (belt OR strap OR piezoelect$5 OR vest OR band))				
S938	302	S936 AND ((transmi$6 OR transceiv$5 OR wireless$3 OR radio OR radiofrequenc$3 OR antenna OR telemet$4) SAME ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:41
S939	435	(("600"/$) OR ("128"/$)).ccls. AND (("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5)) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (belt OR strap OR piezoelect$5))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:41
S940	684	(("600"/$) OR ("128"/$)).ccls. AND (("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5)) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR saturation) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME	US-PGPUB; USPAT	OR	ON	2022/05/19 17:41

		(belt OR strap OR piezoelect$5 OR vest OR band))				
S941	684	S940 AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR saturation) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (belt OR strap OR piezoelect$5 OR vest OR band))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:42
S942	1	("20020185130").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:42
S943	27	("20030000528" | "20040163648" | "20040254493" | "20050081847" | "20050085738" | "20050115561" | "20050165323" | "20050217674" | "20050268916" | "20050188991" | "20060247546" | "5645043" | "5961447" | "6029664" | "6138675" | "6229581" | "6431171" | "6551252" | "6889691" | "7190995" | "7195013" | "7204250" | "7225809" | "7309314" | "7575005" | "7668579" | "7670295").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:42
S944	15	((jonathan NEAR2 wright) OR (anthony NEAR2 ujhazy)).inv. AND CPAP AND pulse AND (respiratory ADJ2 movement)	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:42
S945	15	S944 AND (sleep$3 WITH (disorder OR symptom OR condition OR illness))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:42
S946	0	S944 AND (realtime OR (real ADJ2 time))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:42
S947	15	S944 AND (nebuliz$3 OR medication OR medicine OR drug OR agent)	US-PGPUB; USPAT	OR	ON	2022/05/19 17:42
S948	50	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-	US-PGPUB; USPAT	OR	ON	2022/05/19 17:42

		20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-20100258126-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$ or US-7662101-$ or US-7878198-$).did.				
S949	24	S948 NOT S943	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:43
S950	50	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-20100258126-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-	US-PGPUB; USPAT	OR	ON	2022/05/19 17:43

		6832609-$ or US-7662101-$ or US-7878198-$).did.				
S951	34	("20020185130" | "20030000528" | "20040138576" | "20040163648" | "20040254493" | "20050081847" | "20050085738" | "20050115561" | "20050165323" | "20050217674" | "20050268916" | "20050188991" | "20060084877" | "20060247546" | "5645043" | "5961447" | "6029664" | "6138675" | "6229581" | "6431171" | "6551252" | "6832609" | "6889691" | "7018341" | "7190995" | "7195013" | "7204250" | "7225809" | "7309314" | "7575005" | "7662101" | "7668579" | "7670295" | "7878198").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:43
S952	51	S950 OR S951	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:43
S953	31	((severit$4 OR level OR depth OR stag$3) WITH (apne$4 OR hypopne$5 OR hypoapne$5 OR hyperapne$5)) AND S952	US-PGPUB; USPAT	OR	ON	2022/05/19 17:43
S954	31	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (signal$3 OR data OR sens$5 OR information OR parameter)) AND (apne$4 OR hypopne$5 OR hypoapne$5 OR hyperapne$5) AND S952	US-PGPUB; USPAT	OR	ON	2022/05/19 17:43
S955	31	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (signal$3 OR data OR sens$5 OR information OR parameter)) AND S954	US-PGPUB; USPAT	OR	ON	2022/05/19 17:43
S956	9	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (signal$3 OR data OR sens$5 OR information OR parameter)) AND ((apne$4 OR hypopne$5 OR hypoapne$5 OR hyperapne$5) WITH (index OR indices)) AND S952	US-PGPUB; USPAT	OR	ON	2022/05/19 17:43
S957	6	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME ((radio OR radiofrequenc$3 OR "RF" OR	US-PGPUB; USPAT	OR	ON	2022/05/19 17:43

		wireless$3) WITH (transmi$6 OR transceiv$3 OR telemet$5 OR communicat$5 OR receiv$3 OR antenna))) AND S952				
S958	0	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME ((radio OR radiofrequenc$3 OR "RF" OR wireless$3) WITH (transmi$6 OR transceiv$3 OR telemet$5 OR communicat$5 OR receiv$3 OR antenna)) SAME acquistion) AND (600/484,529-543).ccls.	US-PGPUB; USPAT	OR	ON	2022/05/19 17:44
S959	181	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME ((radio OR radiofrequenc$3 OR "RF" OR wireless$3) WITH (transmi$6 OR transceiv$3 OR telemet$5 OR communicat$5 OR receiv$3 OR antenna))) AND (apne$4 OR hypopne$5 OR hypoapne$5 OR hyperapne$5) AND ((600/484,529-543) OR (128/204.21-204.26)).ccls.	US-PGPUB; USPAT	OR	ON	2022/05/19 17:44
S960	181	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME ((radio OR radiofrequenc$3 OR "RF" OR wireless$3) WITH (transmi$6 OR transceiv$3 OR telemet$5 OR communicat$5 OR receiv$3 OR antenna))) AND S959	US-PGPUB; USPAT	OR	ON	2022/05/19 17:44
S961	35	("20050165323" | "6889691" | "7204250" | "20050085738" | "6551252" | "7309314" | "6029664" | "20040254493" | "7575005" | "7670295" | "7662101" | "7101341" | "6138675" | "20050217674" | "20040163648" | "20050081847" | "20040138576" | "20060084877" | "7878198" | "5645043" | "20030000528" | "20050268916" | "20060247546" | "7190995" | "20050188991" | "7668579" | "7018341" | "20050115561" | "5961447" | "7195013" | "7225809" | "20020185130" | "6229581" | "6431171" | "6832609").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:44
S962	5	(("7190995") or ("20050115561") or ("20020185130") or ("7878198") or ("7101341")).PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:44

S963	1	(US-7878198-$).did.	USPAT	OR	ON	2022/05/19 17:44
S964	1	S963 AND ((determin$6 OR calculat$4 OR compute OR computing OR output$4 OR derive OR deriving) WITH pressure)	US-PGPUB; USPAT	OR	ON	2022/05/19 17:44
S965	0	S963 AND ("FFT" OR fourier)	US-PGPUB; USPAT	OR	ON	2022/05/19 17:44
S966	1	S962 AND ("FFT" OR fourier)	US-PGPUB; USPAT	OR	ON	2022/05/19 17:45
S967	0	S963 AND ((atmospher$5 OR environment OR baromet$5) WITH (level OR pressure OR concentration))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:45
S968	1	S963 AND (oxygen OR carbon OR "O2" OR "CO2")	US-PGPUB; USPAT	OR	ON	2022/05/19 17:45
S969	50	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-20100258126-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$ or US-7662101-$ or US-7878198-$).did.	US-PGPUB; USPAT	OR	ON	2022/05/19 17:45
S970	35	("20050165323" | "6889691" | "7204250" | "20050085738" | "6551252" | "7309314" | "6029664" | "20040254493" | "7575005" |	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:45

		"7670295" | "7662101" | "7101341" | "6138675" | "20050217674" | "20040163648" | "20050081847" | "20040138576" | "20060084877" | "7878198" | "5645043" | "20030000528" | "20050268916" | "20060247546" | "7190995" | "20050188991" | "7668579" | "7018341" | "20050115561" | "5961447" | "7195013" | "7225809" | "20020185130" | "6229581" | "6431171" | "6832609").PN.				
S971	52	S969 OR S970	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:45
S972	15	S971 AND ("FFT" OR fourier)	US-PGPUB; USPAT	OR	ON	2022/05/19 17:45
S973	0	S963 AND (burton)	US-PGPUB; USPAT	OR	ON	2022/05/19 17:45
S974	1	S963 AND (berthon)	US-PGPUB; USPAT	OR	ON	2022/05/19 17:46
S975	1	("11165705").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:46
S976	3	(("5704345") or ("6152129") or ("6532959")).PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:46
S977	1	S976 AND ("FFT" OR fourier)	US-PGPUB; USPAT	OR	ON	2022/05/19 17:46
S978	0	S976 AND ((oxygen OR carbon OR "O2" OR "CO2") WITH (deliver$4 OR administer$4 OR administrat$4 OR provid$4 OR pump$3))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:46
S979	15	S971 AND ((oxygen OR carbon OR "O2" OR "CO2") WITH (deliver$4 OR administer$4 OR administrat$4 OR provid$4 OR pump$3))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:46
S980	12	S971 AND (((oxygen OR carbon OR "O2" OR "CO2") WITH (deliver$4 OR administer$4 OR administrat$4 OR provid$4 OR pump$3)) SAME ("CPAP" OR "PAP" OR (positive$3 ADJ4 pressure)))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:47
S981	11	S971 AND (((oxygen OR carbon OR "O2" OR "CO2") WITH (deliver$4 OR administer$4 OR administrat$4 OR provid$4 OR pump$3)) AND ("CPAP" OR "PAP" OR (positive$3 ADJ2 airway ADJ2 pressure)))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:47

S982	1	(US-20050217674-$).did.	US-PGPUB	OR	ON	2022/05/19 17:47
S983	1	S982 AND ((oxygen OR gas OR carbon OR "O2" OR "CO2") WITH (deliver$4 OR administer$4 OR administrat$4 OR provid$4 OR pump$3 OR pressuriz$6))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:47
S984	35	("20050165323" | "6889691" | "7204250" | "20050085738" | "6551252" | "7309314" | "6029664" | "20040254493" | "7575005" | "7670295" | "7662101" | "7101341" | "6138675" | "20050217674" | "20040163648" | "20050081847" | "20040138576" | "20060084877" | "7878198" | "5645043" | "20030000528" | "20050268916" | "20060247546" | "7190995" | "20050188991" | "7668579" | "7018341" | "20050115561" | "5961447" | "7195013" | "7225809" | "20020185130" | "6229581" | "6431171" | "6832609").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:47
S985	8	"11266899"	US-PGPUB; USPAT	OR	ON	2022/05/19 17:47
S986	1	("11266899").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:47
S987	36	S984 OR S986	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:47
S988	2	(("11266899") or ("13440116")).PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:48
S989	1	(US-8172766-$).did.	USPAT	OR	ON	2022/05/19 17:48
S990	28,827	(A61B5/02055 OR A61B5/085 OR A61B5/4815 OR A61M16/0051 OR A61M16/0069 OR A61M2016/0027 OR A61M2016/0039 OR A61M2202/0208 OR A61M2205/3553 OR A61M2205/3561 OR A61M2205/3584 OR A61M2205/3592 OR A61M2230/04 OR A61M2230/10 OR A61M2230/14 OR A61M2230/202 OR A61M2230/205 OR A61M2230/60).CPC.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:48
S991	2	(("7878198") or ("20020185130")).PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:48
S992	51	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$	US-PGPUB; USPAT	OR	ON	2022/05/19 17:48

		or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-20100258126-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$ or US-7662101-$ or US-7878198-$ or US-8172766-$).did.				
S993	36	("20020185130" | "20030000528" | "20040138576" | "20040163648" | "20040254493" | "20050081847" | "20050085738" | "20050115561" | "20050165323" | "20050188991" | "20050217674" | "20050268916" | "20060084877" | "20060247546" | "5645043" | "5961447" | "6029664" | "6138675" | "6229581" | "6431171" | "6551252" | "6832609" | "6889691" | "7018341" | "7101341" | "7190995" | "7195013" | "7204250" | "7225809" | "7309314" | "7575005" | "7662101" | "7668579" | "7670295" | "7878198" | "8172766").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:48
S994	53	S992 OR S993	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:48
S995	2	(("7878198") or ("20020185130")).PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:48
S996	53	S992 OR S993 OR S995	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:48
S997	28,827	(A61B5/02055 OR A61B5/085 OR A61B5/4815 OR A61M16/0051 OR A61M16/0069 OR A61M2016/0027 OR	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:49

		A61M2016/0039 OR A61M2202/0208 OR A61M2205/3553 OR A61M2205/3561 OR A61M2205/3584 OR A61M2205/3592 OR A61M2230/04 OR A61M2230/10 OR A61M2230/14 OR A61M2230/202 OR A61M2230/205 OR A61M2230/60).CPC.				
S998	1,018	((sleep$3 NEAR8 (disorder OR illness OR condition OR obstructi$4)) OR apne$3 OR hypoapne$3 OR hyperapne$3 OR hypopne$3) AND ("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) AND ((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3)) AND ((band OR belt OR vest OR strap OR effort) WITH (inducti$4 OR respir$6 OR breath$3 OR chest OR plethysmograph$5)) AND S997	US-PGPUB; USPAT	OR	ON	2022/05/19 17:49
S999	39	((sleep$3 NEAR8 (disorder OR illness OR condition OR obstructi$4)) OR apne$3 OR hypoapne$3 OR hyperapne$3 OR hypopne$3) AND ("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) AND ((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3)) AND ((band OR belt OR vest OR strap OR effort) WITH (inducti$4 OR respir$6 OR breath$3 OR chest OR plethysmograph$5)) AND S996	US-PGPUB; USPAT	OR	ON	2022/05/19 17:49
S1000	39	((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR	US-PGPUB; USPAT	OR	ON	2022/05/19 17:49

		biometer$3 OR measur$5 OR monitor$3)) AND ((band OR belt OR vest OR strap OR effort) WITH (inducti$4 OR respir$6 OR breath$3 OR chest OR plethysmograph$5)) AND S999				
S1001	39	((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3)) AND ((band OR belt OR vest OR strap OR effort) WITH (inducti$4 OR respir$6 OR breath$3 OR chest OR plethysmograph$5)) AND S999	US-PGPUB; USPAT	OR	ON	2022/05/19 17:49
S1002	1	("5704345").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:49
S1003	241	((sleep$3 NEAR8 (disorder OR illness OR condition OR obstructi$4)) OR apne$3 OR hypoapne$3 OR hyperapne$3 OR hypopne$3) AND ("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) AND ((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4 OR ((oxygen OR "O2") ADJ2 saturation)) WITH ((effort OR inductiv$4) WITH (respir$6 OR breath$3 OR chest OR plethysmograph$5))) AND S997	US-PGPUB; USPAT	OR	ON	2022/05/19 17:49
S1004	241	((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4 OR ((oxygen OR "O2") ADJ2 saturation)) WITH ((effort OR inductiv$4) WITH (respir$6 OR breath$3 OR chest OR plethysmograph$5))) AND S1003	US-PGPUB; USPAT	OR	ON	2022/05/19 17:50
S1005	1	(US-5353788-$).did.	USPAT	OR	ON	2022/05/19 17:50
S1006	0	S1005 AND (fourier)	US-PGPUB; USPAT	OR	ON	2022/05/19 17:50
S1007	287	("4655213" | "4686975" | "4807616" | "4938212" | "4944310" | "4957107" | "5042478" | "5047930" | "5065756" | "5109839" | "5117819" | "5134995" | "5146918" | "5148802").PN. OR ("5353788").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 17:50

S1008	109	S1007 AND (fourier OR "FFT" OR (standard ADJ2 deviat$5) OR ARMAX OR (((time ADJ2 frequenc$3) OR wavelet) NEAR3 analy$6))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:50
S1009	0	S1005 AND (fourier OR "FFT" OR (standard ADJ2 deviat$5) OR ARMAX OR (((time ADJ2 frequenc$3) OR wavelet) NEAR3 analy$6))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:50
S1010	285	("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) AND ((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4 OR ((oxygen OR "O2") ADJ2 saturation)) WITH ((effort OR inductiv$4) WITH (respir$6 OR breath$3 OR chest OR plethysmograph$5))) AND (fourier OR "FFT" OR (standard ADJ2 deviat$5) OR ARMAX OR (((time ADJ2 frequenc$3) OR wavelet) NEAR3 analy$6))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:50
S1011	285	S1010 AND ((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4 OR ((oxygen OR "O2") ADJ2 saturation)) WITH ((effort OR inductiv$4) WITH (respir$6 OR breath$3 OR chest OR plethysmograph$5))) AND (fourier OR "FFT" OR (standard ADJ2 deviat$5) OR ARMAX OR (((time ADJ2 frequenc$3) OR wavelet) NEAR3 analy$6))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:50
S1012	1	(US-5353788-$).did.	USPAT	OR	ON	2022/05/19 17:50
S1013	0	S1012 AND (wireles$3)	US-PGPUB; USPAT	OR	ON	2022/05/19 17:51
S1014	0	S1012 AND (wireles$3 OR radio OR radiofrequenc$3 OR "RF")	US-PGPUB; USPAT	OR	ON	2022/05/19 17:51
S1015	1	("13440116").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:51
S1016	1	("11266899").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:51
S1017	1	S1016 AND bidirection$4	US-PGPUB; USPAT	OR	ON	2022/05/19 17:51
S1018	0	S1012 AND (chemical$4)	US-PGPUB; USPAT	OR	ON	2022/05/19 17:51
S1019	1	S1016 AND quantitative$4	US-PGPUB; USPAT	OR	ON	2022/05/19 17:52

S1020	58	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-20100258126-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$ or US-7662101-$ or US-7878198-$ or US-8172766-$ or US-5704345-$ or US-5353788-$ or US-8069852-$ or US-7942824-$ or US-8365730-$).did. or (US-8545416-$ or US-8356594-$).did.	US-PGPUB; USPAT	OR	ON	2022/05/19 17:52
S1021	5	S1020 AND (short NEAR5 fourier)	US-PGPUB; USPAT	OR	ON	2022/05/19 17:52
S1022	86	("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) AND ((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4 OR ((oxygen OR "O2") ADJ2 saturation)) SAME ((effort OR inductiv$4) WITH (respir$6 OR breath$3 OR chest OR plethysmograph$5))) AND (short NEAR5 fourier)	US-PGPUB; USPAT	OR	ON	2022/05/19 17:52
S1023	86	S1022 AND (short NEAR5 fourier)	US-PGPUB; USPAT	OR	ON	2022/05/19 17:52
S1024	86	S1022 AND (short NEAR5 fourier)	US-PGPUB; USPAT	OR	ON	2022/05/19 17:52

S1025	566	("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) AND ((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4 OR ((oxygen OR "O2") ADJ2 saturation)) SAME ((effort OR inductiv$4) WITH (respir$6 OR breath$3 OR chest OR plethysmograph$5))) AND (fourier OR "STFT" OR "FFT" OR (standard ADJ2 deviat$5) OR ARMAX OR (((time ADJ2 frequenc$3) OR wavelet) NEAR3 analy$6))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:52
S1026	27	("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) AND ((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4 OR ((oxygen OR "O2") ADJ2 saturation)) SAME ((effort OR inductiv$4) WITH (respir$6 OR breath$3 OR chest OR plethysmograph$5)) SAME (fourier OR "STFT" OR "FFT" OR (standard ADJ2 deviat$5) OR ARMAX OR (((time ADJ2 frequenc$3) OR wavelet) NEAR3 analy$6)))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:52
S1027	27	S1026 AND ((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4 OR ((oxygen OR "O2") ADJ2 saturation)) SAME ((effort OR inductiv$4) WITH (respir$6 OR breath$3 OR chest OR plethysmograph$5)) SAME (fourier OR "STFT" OR "FFT" OR (standard ADJ2 deviat$5) OR ARMAX OR (((time ADJ2 frequenc$3) OR wavelet) NEAR3 analy$6)))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:53
S1028	17	S1026 AND ((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4 OR ((oxygen OR "O2") ADJ2 saturation)) SAME ((effort OR inductiv$4) WITH (respir$6 OR breath$3 OR chest OR plethysmograph$5)) SAME (sensor$4 OR transducer)) AND (fourier OR "STFT" OR "FFT" OR (standard ADJ2 deviat$5) OR ARMAX OR (((time ADJ2 frequenc$3) OR wavelet) NEAR3 analy$6))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:53
S1029	247	("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4	US-PGPUB; USPAT	OR	ON	2022/05/19 17:53

		OR respirator) AND ((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4 OR ((oxygen OR "O2") ADJ2 saturation)) SAME ((effort OR inductiv$4) WITH (respir$6 OR breath$3 OR chest OR plethysmograph$5)) SAME (sensor$4 OR transducer)) AND (fourier OR "STFT" OR "FFT" OR (standard ADJ2 deviat$5) OR ARMAX OR (((time ADJ2 frequenc$3) OR wavelet) NEAR3 analy$6))				
S1030	247	S1029 AND (fourier OR "STFT" OR "FFT" OR (standard ADJ2 deviat$5) OR ARMAX OR (((time ADJ2 frequenc$3) OR wavelet) NEAR3 analy$6))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:53
S1031	247	("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) AND ((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4 OR ((oxygen OR "O2") ADJ2 saturation)) SAME ((effort OR inductiv$4) WITH (respir$6 OR breath$3 OR chest OR plethysmograph$5)) SAME (sensor$4 OR transducer)) AND (fourier OR "STFT" OR "FFT" OR (standard ADJ2 deviat$5) OR ARMAX OR (((time ADJ2 frequenc$3) OR wavelet) NEAR3 analy$6))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:53
S1032	247	S1031 AND (fourier OR "STFT" OR "FFT" OR (standard ADJ2 deviat$5) OR ARMAX OR (((time ADJ2 frequenc$3) OR wavelet) NEAR3 analy$6))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:53
S1033	784	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (control$4 OR regulat$4 OR set OR setting OR automatic$5)) AND ((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4 OR ((oxygen OR "O2") ADJ2 saturation)) SAME ((effort OR inductiv$4) WITH (respir$6 OR breath$3 OR chest OR plethysmograph$5)))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:53
S1034	147	((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4 OR ((oxygen OR "O2") ADJ2 saturation)) SAME ((effort OR inductiv$4) WITH (respir$6 OR breath$3 OR chest OR	US-PGPUB; USPAT	OR	ON	2022/05/19 17:54

		plethysmograph$5)) SAME ("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (control$4 OR regulat$4 OR set OR setting OR automatic$5))				
S1035	58	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-20100258126-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$ or US-7662101-$ or US-7878198-$ or US-8172766-$ or US-5704345-$ or US-5353788-$ or US-8069852-$ or US-7942824-$ or US-8365730-$).did. or (US-8545416-$ or US-8356594-$).did.	US-PGPUB; USPAT	OR	ON	2022/05/19 17:54
S1036	8	(bidirection$5 WITH (communicat$4 OR telemet$4 OR command$4 OR signal$3 OR wireless$4 OR transmi$6 OR receiv$4)) AND S1035	US-PGPUB; USPAT	OR	ON	2022/05/19 17:54
S1037	45	(bidirection$5 WITH (communicat$4 OR telemet$4 OR command$4 OR signal$3 OR wireless$4 OR transmi$6 OR receiv$4)) AND (("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (control$4 OR regulat$4 OR set	US-PGPUB; USPAT	OR	ON	2022/05/19 17:54

		OR setting OR automatic$5)) AND ((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4 OR ((oxygen OR "O2") ADJ2 saturation)) SAME ((effort OR inductiv$4) WITH (respir$6 OR breath$3 OR chest OR plethysmograph$5)))				
S1038	45	(bidirection$5 WITH (communicat$4 OR telemet$4 OR command$4 OR signal$3 OR wireless$4 OR transmi$6 OR receiv$4)) AND S1037	US-PGPUB; USPAT	OR	ON	2022/05/19 17:54
S1039	331	(((bidirection$5 OR ((two OR "2") ADJ2 way)) WITH (communicat$4 OR telemet$4 OR command$4 OR signal$3 OR wireless$4 OR transmi$6 OR receiv$4)) SAME ((data ADJ2 acquisit$5) OR sensor OR transducer OR monitor$3) SAME ("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (control$4 OR regulat$4 OR set OR setting OR automatic$5))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:54
S1040	1	(US-5237990-$).did.	USPAT	OR	ON	2022/05/19 17:54
S1041	0	S1040 AND (wireless$3 OR "RF" OR radio OR radiofrequenc$3)	US-PGPUB; USPAT	OR	ON	2022/05/19 17:55
S1042	377	(((bidirection$5 OR ((two OR "2") ADJ2 way)) WITH (communicat$4 OR telemet$4 OR command$4 OR signal$3 OR transmi$6 OR receiv$4)) SAME (wireless$4 OR "RF" OR radio OR radiofrequenc$3 OR bluetooth) SAME ("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:55
S1043	24	(((bidirection$5 OR ((two OR "2") ADJ2 way)) WITH (communicat$4 OR telemet$4 OR command$4 OR signal$3 OR transmi$6 OR receiv$4)) SAME (wireless$4 OR "RF" OR radio OR radiofrequenc$3 OR bluetooth) SAME ("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure)))	US-PGPUB; USPAT	OR	ON	2022/05/19 17:55
S1045	197	(((bidirection$5 OR ((two OR "2") ADJ2 way)) WITH (communicat$4 OR telemet$4 OR command$4 OR signal$3 OR transmi$6 OR receiv$4)) SAME (wireless$4 OR "RF" OR radio OR radiofrequenc$3 OR bluetooth)) AND	US-PGPUB; USPAT	OR	ON	2022/05/19 17:55

		("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure)) AND ((128/$) OR (600/$)).CCLS.				
S1046	16	(((bidirection$5 OR ((two OR "2") ADJ2 way)) SAME (wireless$4 OR "RF" OR radio OR radiofrequenc$3 OR bluetooth)) SAME ("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure))) AND ((128/$) OR (600/$)).CCLS.	US-PGPUB; USPAT	OR	ON	2022/05/19 17:55
S1047	36	("20020185130" | "20030000528" | "20040138576" | "20040163648" | "20040254493" | "20050081847" | "20050085738" | "20050115561" | "20050165323" | "20050188991" | "20050217674" | "20050268916" | "20060084877" | "20060247546" | "5645043" | "5961447" | "6029664" | "6138675" | "6229581" | "6431171" | "6551252" | "6832609" | "6889691" | "7018341" | "7101341" | "7190995" | "7195013" | "7204250" | "7225809" | "7309314" | "7575005" | "7662101" | "7668579" | "7670295" | "7878198" | "8172766").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:56
S1048	60	S1035 OR S1047	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:56
S1049	11	((bidirection$5 OR ((two OR "2") ADJ2 way)) SAME (wireless$4 OR "RF" OR radio OR radiofrequenc$3 OR bluetooth)) AND S1048	US-PGPUB; USPAT	OR	ON	2022/05/19 17:56
S1050	174	(((bidirection$5 OR ((two OR "2") ADJ2 way)) SAME (wireless$4 OR "RF" OR radio OR radiofrequenc$3 OR bluetooth)) AND ("CPAP" OR (positive ADJ2 airway ADJ2 pressure))) AND ((128/$) OR (600/$)).CCLS.	US-PGPUB; USPAT	OR	ON	2022/05/19 17:56
S1051	174	((bidirection$5 OR ((two OR "2") ADJ2 way)) SAME (wireless$4 OR "RF" OR radio OR radiofrequenc$3 OR bluetooth)) AND S1050	US-PGPUB; USPAT	OR	ON	2022/05/19 17:56
S1052	1	(US-7757690-$).did.	USPAT	OR	ON	2022/05/19 17:56
S1053	1	(US-5353788-$).did.	USPAT	OR	ON	2022/05/19 17:56
S1054	1	(US-5237990-$).did.	USPAT	OR	ON	2022/05/19 17:56

S1055	3	S1052 OR S1053 OR S1054	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:56
S1056	2	S1055 NOT S1035	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:56
S1057	60	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-20100258126-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$ or US-7662101-$ or US-7878198-$ or US-8172766-$ or US-5704345-$ or US-5353788-$ or US-8069852-$ or US-7942824-$ or US-8365730-$).did. or (US-8545416-$ or US-8356594-$ or US-5237990-$ or US-7757690-$).did.	US-PGPUB; USPAT	OR	ON	2022/05/19 17:56
S1058	36	("20020185130" | "20030000528" | "20040138576" | "20040163648" | "20040254493" | "20050081847" | "20050085738" | "20050115561" | "20050165323" | "20050188991" | "20050217674" | "20050268916" | "20060084877" | "20060247546" | "5645043" | "5961447" | "6029664" | "6138675" | "6229581" | "6431171" | "6551252" | "6832609" | "6889691" | "7018341" | "7101341" | "7190995" |	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:57

		"7195013" | "7204250" | "7225809" | "7309314" | "7575005" | "7662101" | "7668579" | "7670295" | "7878198" | "8172766").PN.				
S1059	28,827	(A61B5/02055 OR A61B5/085 OR A61B5/4815 OR A61M16/0051 OR A61M16/0069 OR A61M2016/0027 OR A61M2016/0039 OR A61M2202/0208 OR A61M2205/3553 OR A61M2205/3561 OR A61M2205/3584 OR A61M2205/3592 OR A61M2230/04 OR A61M2230/10 OR A61M2230/14 OR A61M2230/202 OR A61M2230/205 OR A61M2230/60).CPC.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:57
S1060	38	("20040138576" | "20050165323" | "6029664" | "7190995" | "7204250" | "7225809" | "7878198" | "5237990" | "20020185130" | "20060084877" | "6229581" | "7101341" | "7668579" | "20040254493" | "20050085738" | "7018341" | "7670295" | "20040163648" | "5961447" | "6431171" | "8172766" | "20050115561" | "6138675" | "20050188991" | "20050217674" | "20050268916" | "20060247546" | "5645043" | "6832609" | "7195013" | "7757690" | "20030000528" | "6551252" | "6889691" | "7575005" | "20050081847" | "7309314" | "7662101").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:57
S1061	62	S1057 OR S1058 OR S1060	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:57
S1062	7,486	((KAYYALI NEAR2 HANI) OR (SCHMIDT NEAR2 ROBERT) OR ((("MODARRES-ZADEH") OR (MODARRES ADJ2 ZADEH)) NEAR2 MOHAMMAD) OR (KOLKOWSKI NEAR2 BRIAN)).INV.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2022/05/19 17:57
S1063	2	(("11266899") or ("13440116")).PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:57
S1064	1	S1063 AND enclosure	US-PGPUB; USPAT	OR	ON	2022/05/19 17:57
S1065	2	S1063 AND blower	US-PGPUB; USPAT	OR	ON	2022/05/19 17:58
S1066	1	("5353788").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:58
S1067	60	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$	US-PGPUB; USPAT	OR	ON	2022/05/19 17:58

		or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-20100258126-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$ or US-7662101-$ or US-7878198-$ or US-8172766-$ or US-5704345-$ or US-5353788-$ or US-8069852-$ or US-7942824-$ or US-8365730-$).did. or (US-8545416-$ or US-8356594-$ or US-5237990-$ or US-7757690-$).did.				
S1068	36	("20020185130" | "20030000528" | "20040138576" | "20040163648" | "20040254493" | "20050081847" | "20050085738" | "20050115561" | "20050165323" | "20050188991" | "20050217674" | "20050268916" | "20060084877" | "20060247546" | "5645043" | "5961447" | "6029664" | "6138675" | "6229581" | "6431171" | "6551252" | "6832609" | "6889691" | "7018341" | "7101341" | "7190995" | "7195013" | "7204250" | "7225809" | "7309314" | "7575005" | "7662101" | "7668579" | "7670295" | "7878198" | "8172766").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:58
S1069	38	("20040138576" | "20050165323" | "6029664" | "7190995" | "7204250" | "7225809" | "7878198" | "5237990" |	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:58

		"20020185130" | "20060084877" | "6229581" | "7101341" | "7668579" | "20040254493" | "20050085738" | "7018341" | "7670295" | "20040163648" | "5961447" | "6431171" | "8172766" | "20050115561" | "6138675" | "20050188991" | "20050217674" | "20050268916" | "20060247546" | "5645043" | "6832609" | "7195013" | "7757690" | "20030000528" | "6551252" | "6889691" | "7575005" | "20050081847" | "7309314" | "7662101").PN.				
S1070	62	S1067 OR S1068 OR S1069	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:58
S1071	2	(("20120245447") or ("8920332")).PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:58
S1072	7,486	((KAYYALI NEAR2 HANI) OR (SCHMIDT NEAR2 ROBERT) OR ((("MODARRES-ZADEH") OR (MODARRES ADJ2 ZADEH)) NEAR2 MOHAMMAD) OR (KOLKOWSKI NEAR2 BRIAN)).INV.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2022/05/19 17:58
S1073	3	(differentiat$4 WITH central WITH obstructive WITH (apnea OR apneic OR hypoopne$3 OR hypopne$3)).clm. AND S1072	US-PGPUB; USPAT	OR	ON	2022/05/19 17:59
S1074	7,615	((KAYYALI NEAR2 HANI) OR (SCHMIDT NEAR2 ROBERT) OR ((("MODARRES-ZADEH") OR (MODARRES ADJ2 ZADEH)) NEAR2 MOHAMMAD) OR (KOLKOWSKI NEAR2 BRIAN)).INV. OR (cleveland ADJ2 medical).as.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2022/05/19 17:59
S1075	3	(differentiat$4 WITH central WITH obstructive WITH (apnea OR apneic OR hypoopne$3 OR hypopne$3)).clm. AND S1074	US-PGPUB; USPAT	OR	ON	2022/05/19 17:59
S1076	3	(differentiat$4 WITH (apnea OR apneic OR hypoopne$3 OR hypopne$3)).clm. AND S1074	US-PGPUB; USPAT	OR	ON	2022/05/19 17:59
S1077	85,588	(A61B5/02055 OR A61B5/085 OR A61B5/4815 OR A61M16/0051 OR A61M16/0069 OR A61M2016/0027 OR A61M2016/0039 OR A61M2202/0208 OR A61M2205/3553 OR A61M2205/3561 OR A61M2205/3584 OR A61M2205/3592 OR A61M2230/04	US-PGPUB; USPAT	OR	OFF	2022/05/19 17:59

		OR A61M2230/10 OR A61M2230/14 OR A61M2230/202 OR A61M2230/205 OR A61M2230/60).CPC. OR ((600/484,529-543) OR ("128"/$)).ccls.				
S1078	412	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator)) AND (central WITH (obstructiv$4 OR hypopne$5 OR hypoapne$5) WITH (distinguish$5 OR determin$6 OR differentiat$5)) AND S1077	US-PGPUB; USPAT	OR	ON	2022/05/19 17:59
S1079	412	(central WITH (obstructiv$4 OR hypopne$5 OR hypoapne$5) WITH (distinguish$5 OR determin$6 OR differentiat$5)) AND S1078	US-PGPUB; USPAT	OR	ON	2022/05/19 17:59
S1080	268	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator)) AND (central WITH (obstructiv$4 OR hypopne$5 OR hypoapne$5) WITH (distinguish$5 OR identify$3 OR identification OR differentiat$5)) AND S1077	US-PGPUB; USPAT	OR	ON	2022/05/19 17:59
S1081	268	(central WITH (obstructiv$4 OR hypopne$5 OR hypoapne$5) WITH (distinguish$5 OR identify$3 OR identification OR differentiat$5)) AND S1080	US-PGPUB; USPAT	OR	ON	2022/05/19 18:00
S1082	2	(("11266899") or ("13440116")).PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:00
S1083	0	(central WITH (obstructiv$4 OR hypopne$5 OR hypoapne$5) WITH (distinguish$5 OR identify$3 OR identification OR differentiat$5)) AND S1082	US-PGPUB; USPAT	OR	ON	2022/05/19 18:00
S1084	2	(central WITH obstructiv$4 WITH (apne$3 OR hypopne$5 OR hypoapne$5)) AND S1082	US-PGPUB; USPAT	OR	ON	2022/05/19 18:00
S1085	2	(central SAME obstructiv$4 SAME (apne$3 OR hypopne$5 OR hypoapne$5)) AND S1082	US-PGPUB; USPAT	OR	ON	2022/05/19 18:00
S1086	2	((central OR complex OR obstructiv$4) SAME (apne$3 OR hypopne$5 OR hypoapne$5)) AND S1082	US-PGPUB; USPAT	OR	ON	2022/05/19 18:00
S1087	85,588	(A61B5/02055 OR A61B5/085 OR A61B5/4815 OR A61M16/0051 OR A61M16/0069 OR A61M2016/0027 OR A61M2016/0039 OR A61M2202/0208	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:00

		OR A61M2205/3553 OR A61M2205/3561 OR A61M2205/3584 OR A61M2205/3592 OR A61M2230/04 OR A61M2230/10 OR A61M2230/14 OR A61M2230/202 OR A61M2230/205 OR A61M2230/60).CPC. OR ((600/484,529-543) OR ("128"/$)).ccls.				
S1088	268	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator)) AND (central WITH (obstructiv$4 OR hypopne$5 OR hypoapne$5) WITH (distinguish$5 OR identify$3 OR identification OR differentiat$5)) AND S1087	US-PGPUB; USPAT	OR	ON	2022/05/19 18:01
S1089	268	(central WITH (obstructiv$4 OR hypopne$5 OR hypoapne$5) WITH (distinguish$5 OR identify$3 OR identification OR differentiat$5)) AND S1088	US-PGPUB; USPAT	OR	ON	2022/05/19 18:01
S1090	2	(("11266899") or ("13440116")).PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:01
S1091	2	((central OR complex OR obstructiv$4) SAME (apne$3 OR hypopne$5 OR hypoapne$5)) AND S1090	US-PGPUB; USPAT	OR	ON	2022/05/19 18:01
S1092	2	(atmospher$3) AND S1090	US-PGPUB; USPAT	OR	ON	2022/05/19 18:01
S1093	2	(severity) AND S1090	US-PGPUB; USPAT	OR	ON	2022/05/19 18:01
S1094	2	(carbon) AND S1090	US-PGPUB; USPAT	OR	ON	2022/05/19 18:02
S1095	1	("13440116").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:02
S1096	2	("14540623").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:02
S1097	2	(side ADJ2 effect ADJ4 dosing) AND S1096	US-PGPUB; USPAT	OR	ON	2022/05/19 18:02
S1098	0	(display$3) AND S1096	US-PGPUB; USPAT	OR	ON	2022/05/19 18:02
S1099	2	(alert$4) AND S1096	US-PGPUB; USPAT	OR	ON	2022/05/19 18:02
S1100	2	(alert$4 OR warn$3 OR alarm$4) AND S1096	US-PGPUB; USPAT	OR	ON	2022/05/19 18:03
S1101	228,798	(A61B5/02055 OR A61B5/085 OR A61B5/4815 OR A61M16/0051 OR A61M16/0069 OR A61M2016/0027 OR A61M2016/0039 OR A61M2202/0208	US-PGPUB; USPAT; USOCR	OR	OFF	2022/05/19 18:03

		OR A61M2205/3553 OR A61M2205/3561 OR A61M2205/3584 OR A61M2205/3592 OR A61M2230/04 OR A61M2230/10 OR A61M2230/14 OR A61M2230/202 OR A61M2230/205 OR A61M2230/60).CPC. OR ((600/$) OR ("128"/$)).ccls.				
S1102	1,203	(((bidirection$4 OR (two ADJ2 way) OR transceiv$5) WITH (wireless$3 OR communicat$4 OR send$3 OR telemet$4 OR transmiss$4 OR transmit$4 OR send$3 OR receiv$3 OR radio OR radiofrequenc$3 OR "RF")) SAME ((command$3 OR instruct$4 OR control$4) WITH (reconfigur$6 OR configur$6 OR set OR setting OR profile))) AND ((pulseox OR pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR (("O2" OR oxygen) ADJ2 saturat$4)) WITH (sens$5 OR detect$4 OR meter$4 OR probe OR transducer OR monitor$3)) AND S1101	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 18:03
S1103	1,203	(((bidirection$4 OR (two ADJ2 way) OR transceiv$5) WITH (wireless$3 OR communicat$4 OR send$3 OR telemet$4 OR transmiss$4 OR transmit$4 OR send$3 OR receiv$3 OR radio OR radiofrequenc$3 OR "RF")) SAME ((command$3 OR instruct$4 OR control$4) WITH (reconfigur$6 OR configur$6 OR set OR setting OR profile))) AND ((pulseox OR pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR (("O2" OR oxygen) ADJ2 saturat$4)) WITH (sens$5 OR detect$4 OR meter$4 OR probe OR transducer OR monitor$3)) AND S1101	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 18:03
S1104	328	(((bidirection$4 OR (two ADJ2 way) OR transceiv$5) WITH (wireless$3 OR communicat$4 OR send$3 OR telemet$4 OR transmiss$4 OR transmit$4 OR send$3 OR receiv$3 OR radio OR radiofrequenc$3 OR "RF")) SAME ((reconfigur$6 OR configur$6 OR set OR setting OR profile) WITH ((command$3 OR instruct$4 OR control$4) NEAR5 (sens$5 OR detect$4 OR meter$4 OR probe OR transducer OR monitor$3)))) AND ((pulseox OR pulse OR pulsewave$5 OR oximet$4	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 18:03

		OR oxymet$4 OR (("O2" OR oxygen) ADJ2 saturat$4))) AND S1101				
S1105	328	(((bidirection$4 OR (two ADJ2 way) OR transceiv$5) WITH (wireless$3 OR communicat$4 OR send$3 OR telemet$4 OR transmiss$4 OR transmit$4 OR send$3 OR receiv$3 OR radio OR radiofrequenc$3 OR "RF")) SAME ((reconfigur$6 OR configur$6 OR set OR setting OR profile) WITH ((command$3 OR instruct$4 OR control$4) NEAR5 (sens$5 OR detect$4 OR meter$4 OR probe OR transducer OR monitor$3)))) AND S1104	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 18:03
S1106	2	(US-6533729-$ or US-6475153-$).did.	USPAT	OR	ON	2022/05/19 18:03
S1107	2	(((bidirection$4 OR (two ADJ2 way) OR transceiv$5) SAME (wireless$3 OR communicat$4 OR send$3 OR telemet$4 OR transmiss$4 OR transmit$4 OR send$3 OR receiv$3 OR radio OR radiofrequenc$3 OR "RF")) SAME ((reconfigur$6 OR configur$6 OR set OR setting OR profile) WITH ((command$3 OR instruct$4 OR control$4)))) AND S1106	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 18:04
S1108	228,798	(A61B5/02055 OR A61B5/085 OR A61B5/4815 OR A61M16/0051 OR A61M16/0069 OR A61M2016/0027 OR A61M2016/0039 OR A61M2202/0208 OR A61M2205/3553 OR A61M2205/3561 OR A61M2205/3584 OR A61M2205/3592 OR A61M2230/04 OR A61M2230/10 OR A61M2230/14 OR A61M2230/202 OR A61M2230/205 OR A61M2230/60).CPC. OR ((600/$) OR ("128"/$)).ccls.	US-PGPUB; USPAT; USOCR	OR	OFF	2022/05/19 18:04
S1109	228,798	(A61B5/02055 OR A61B5/085 OR A61B5/4815 OR A61M16/0051 OR A61M16/0069 OR A61M2016/0027 OR A61M2016/0039 OR A61M2202/0208 OR A61M2205/3553 OR A61M2205/3561 OR A61M2205/3584 OR A61M2205/3592 OR A61M2230/04 OR A61M2230/10 OR A61M2230/14 OR A61M2230/202 OR A61M2230/205 OR A61M2230/60).CPC. OR ((600/$) OR ("128"/$)).ccls.	US-PGPUB; USPAT; USOCR	OR	OFF	2022/05/19 18:04
S1110	63	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$	US-PGPUB; USPAT	OR	ON	2022/05/19 18:04

		or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-20100258126-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$ or US-7662101-$ or US-7878198-$ or US-8172766-$ or US-5704345-$ or US-5353788-$ or US-8069852-$ or US-7942824-$ or US-8365730-$).did. or (US-8545416-$ or US-8356594-$ or US-5237990-$ or US-7757690-$ or US-6475153-$ or US-6533729-$ or US-8308641-$).did.				
S1111	1	("11130221").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:04
S1112	1	("11130221").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2022/05/19 18:05
S1113	1	"11130221".pn.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:05
S1114	4	"11130221"	US-PGPUB; USPAT	OR	ON	2022/05/19 18:05
S1115	1	("7575005").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:05
S1116	1	S1115 AND (bidirection$4 OR (two ADJ2 way) OR transceiv$5)	US-PGPUB; USPAT	OR	ON	2022/05/19 18:05

S1117	0	S1115 AND (bidirection$4 OR (two ADJ2 way) OR transceiv$5) AND (radio OR "RF" OR radiofrequenc$3)	US-PGPUB; USPAT	OR	ON	2022/05/19 18:06
S1118	15	S1110 AND (bidirection$4 OR (two ADJ2 way) OR transceiv$5) AND (radio OR "RF" OR radiofrequenc$3)	US-PGPUB; USPAT	OR	ON	2022/05/19 18:06
S1119	1	("7225809").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:06
S1120	1	S1119 AND (bidirection$4 OR (two ADJ2 way) OR transceiv$5) AND (radio OR "RF" OR radiofrequenc$3)	US-PGPUB; USPAT	OR	ON	2022/05/19 18:06
S1121	63	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-20100258126-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$ or US-7662101-$ or US-7878198-$ or US-8172766-$ or US-5704345-$ or US-5353788-$ or US-8069852-$ or US-7942824-$ or US-8365730-$).did. or (US-8545416-$ or US-8356594-$ or US-5237990-$ or US-7757690-$ or US-6475153-$ or US-6533729-$ or US-8308641-$).did.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:06
S1122	63	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-	US-PGPUB; USPAT	OR	ON	2022/05/19 18:06

		20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-20100258126-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$ or US-7662101-$ or US-7878198-$ or US-8172766-$ or US-5704345-$ or US-5353788-$ or US-8069852-$ or US-7942824-$ or US-8365730-$).did. or (US-8545416-$ or US-8356594-$ or US-5237990-$ or US-7757690-$ or US-6475153-$ or US-6533729-$ or US-8308641-$).did.				
S1123	17	internet AND S1122	US-PGPUB; USPAT	OR	ON	2022/05/19 18:06
S1124	9	(PDA) AND S1122	US-PGPUB; USPAT	OR	ON	2022/05/19 18:07
S1125	16	(PDA OR cellphone OR cellular OR phone OR telephone) AND S1122	US-PGPUB; USPAT	OR	ON	2022/05/19 18:07
S1126	56	(usage OR operational OR operation) AND S1122	US-PGPUB; USPAT	OR	ON	2022/05/19 18:07
S1127	21	((usage OR operational OR operation) WITH (data OR information OR duration OR interval OR period)) AND S1122	US-PGPUB; USPAT	OR	ON	2022/05/19 18:07
S1128	45	(symptom or severit$3) AND S1122	US-PGPUB; USPAT	OR	ON	2022/05/19 18:07
S1129	1	("7225809").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:08

S1130	0	S1129 AND (data WITH sens$5)	US-PGPUB; USPAT	OR	ON	2022/05/19 18:08
S1131	1	("7225809").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:08
S1132	1	S1131 AND (wireless$3 OR transceiver)	US-PGPUB; USPAT	OR	ON	2022/05/19 18:08
S1133	63	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-20100258126-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$ or US-7662101-$ or US-7878198-$ or US-8172766-$ or US-5704345-$ or US-5353788-$ or US-8069852-$ or US-7942824-$ or US-8365730-$).did. or (US-8545416-$ or US-8356594-$ or US-5237990-$ or US-7757690-$ or US-6475153-$ or US-6533729-$ or US-8308641-$).did.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:08
S1134	14	bluetooth AND S1133	US-PGPUB; USPAT	OR	ON	2022/05/19 18:08
S1135	15	(("CPAP" OR "PAP" OR (positive$4 ADJ2 airway ADJ2 pressure)) SAME ((chemical$4 OR medicat$4 OR medicine OR agent OR drug) WITH (treat$5 OR therap$4 OR administer$4 OR administrat$4))) AND S1133	US-PGPUB; USPAT	OR	ON	2022/05/19 18:08

S1136	15	(("CPAP" OR "PAP" OR (positive$4 ADJ2 airway ADJ2 pressure)) SAME ((chemical$4 OR medicat$4 OR medicine OR agent OR drug OR pharmaceutical$3) WITH (treat$5 OR therap$4 OR administer$4 OR administrat$4))) AND S1133	US-PGPUB; USPAT	OR	ON	2022/05/19 18:09
S1137	16	(("CPAP" OR "PAP" OR (positive$4 ADJ2 airway ADJ2 pressure)) SAME ((chemical$4 OR medicat$4 OR medicine OR agent OR drug OR pharmaceutical$3) WITH (deliver$4 OR treat$5 OR therap$4 OR administer$4 OR administrat$4))) AND S1133	US-PGPUB; USPAT	OR	ON	2022/05/19 18:09
S1138	1	(US-20020185130-$).did.	US-PGPUB	OR	ON	2022/05/19 18:09
S1139	1	(chemical$4 OR medicat$4 OR medicine OR agent OR drug OR pharmaceutical$3) AND S1138	US-PGPUB; USPAT	OR	ON	2022/05/19 18:09
S1140	228,798	(A61B5/02055 OR A61B5/085 OR A61B5/4815 OR A61M16/0051 OR A61M16/0069 OR A61M2016/0027 OR A61M2016/0039 OR A61M2202/0208 OR A61M2205/3553 OR A61M2205/3561 OR A61M2205/3584 OR A61M2205/3592 OR A61M2230/04 OR A61M2230/10 OR A61M2230/14 OR A61M2230/202 OR A61M2230/205 OR A61M2230/60).CPC. OR ((600/$) OR ("128"/$)).ccls.	US-PGPUB; USPAT; USOCR	OR	OFF	2022/05/19 18:09
S1141	32	(("CPAP" OR "PAP" OR (positive$4 ADJ2 airway ADJ2 pressure)) SAME ((chemical$4 OR medicat$4 OR medicine OR agent OR drug OR pharmaceutical$3) WITH (deliver$4 OR treat$5 OR therap$4 OR administer$4 OR administrat$4)) SAME ((adjust$4 OR modification OR modify$3 OR chang$4 OR control$4 OR manag$5) WITH severit$3)) AND S1140	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 18:09
S1142	163	(("CPAP" OR "PAP" OR (positive$4 ADJ2 airway ADJ2 pressure)) SAME ((chemical$4 OR medicat$4 OR medicine OR agent OR drug OR pharmaceutical$3) WITH (deliver$4 OR treat$5 OR therap$4 OR administer$4 OR administrat$4) WITH (adjust$4 OR modification OR modify$3 OR chang$4 OR manag$5))) AND S1140	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 18:10

S1143	38	("20040138576" | "20050165323" | "6029664" | "7190995" | "7204250" | "7225809" | "7878198" | "5237990" | "20020185130" | "20060084877" | "6229581" | "7101341" | "7668579" | "20040254493" | "20050085738" | "7018341" | "7670295" | "20040163648" | "5961447" | "6431171" | "8172766" | "20050115561" | "6138675" | "20050188991" | "20050217674" | "20050268916" | "20060247546" | "5645043" | "6832609" | "7195013" | "7757690" | "20030000528" | "6551252" | "6889691" | "7575005" | "20050081847" | "7309314" | "7662101").PN.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:10
S1144	27	S1133 NOT S1143	US-PGPUB; USPAT	OR	ON	2022/05/19 18:10
S1145	4	(("20020185130") or ("6533729") or ("7575005") or ("7225809")).PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:10
S1146	0	(brian ADJ2 kolkowski).inv. AND (navin NEAR2 natnithithadha) AND severity.clm.	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 18:10
S1147	2	(brian NEAR2 kolkowski).inv. AND (navin NEAR2 natnithithadha) AND severity.clm.	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 18:10
S1148	2	(cleveland ADJ2 medical).AS. AND (navin NEAR2 natnithithadha) AND severity.clm.	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 18:11
S1149	0	(brian ADJ2 kolkowski).inv. AND (navin NEAR2 natnithithadha)	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 18:11
S1150	11	((brian NEAR2 kolkowski).inv. OR (cleveland ADJ2 medical).AS.) AND (navin NEAR2 natnithithadha)	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 18:11
S1151	2	(cleveland ADJ2 medical).AS. AND severity.clm.	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 18:11
S1152	2	(brian NEAR2 kolkowski).inv. AND severity.clm.	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 18:12
S1153	7,486	((KAYYALI NEAR2 HANI) OR (SCHMIDT NEAR2 ROBERT) OR ((("MODARRES-ZADEH") OR (MODARRES ADJ2 ZADEH)) NEAR2 MOHAMMAD) OR (KOLKOWSKI NEAR2 BRIAN)).INV.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2022/05/19 18:12

S1154	1,608	("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) AND ("EEG" OR electroencephal$6 OR ((brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3))) AND ((sleep$3 NEAR8 (disorder OR illness OR condition OR obstructi$4)) OR apne$3 OR hypoapne$3 OR hyperapne$3 OR hypopne$3) AND (("600"/$) OR ("128"/$)).ccls.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:12
S1155	1,002	("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) AND (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3)) AND (((sleep$3 NEAR8 (disorder OR illness OR condition OR obstructi$4)) OR apne$3 OR hypoapne$3 OR hyperapne$3 OR hypopne$3) SAME (treat$5 OR therap$6)) AND (("600"/$) OR ("128"/$)).ccls.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:12
S1156	623	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) AND (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3)) AND (((sleep$3 NEAR8 (disorder OR illness OR condition OR obstructi$4)) OR apne$3 OR hypoapne$3 OR hyperapne$3 OR hypopne$3) SAME (treat$5 OR therap$6)) AND (("600"/$) OR ("128"/$)).ccls.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:12

S1157	131	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3))) AND (((sleep$3 NEAR8 (disorder OR illness OR condition OR obstructi$4)) OR apne$3 OR hypoapne$3 OR hyperapne$3 OR hypopne$3) SAME (treat$5 OR therap$6)) AND (("600"/$) OR ("128"/$)).ccls.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:12
S1158	131	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3))) AND S1157	US-PGPUB; USPAT	OR	ON	2022/05/19 18:13
S1159	141	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3 OR signal$3 OR wave OR waveform OR data OR value))) AND (((sleep$3 NEAR8 (disorder OR illness OR condition OR obstructi$4)) OR apne$3 OR hypoapne$3 OR hyperapne$3 OR hypopne$3) SAME (treat$5 OR therap$6)) AND (("600"/$) OR ("128"/$)).ccls.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:13
S1160	141	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4	US-PGPUB; USPAT	OR	ON	2022/05/19 18:13

		OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3 OR signal$3 OR wave OR waveform OR data OR value))) AND S1159				
S1161	5	("20050217674" | "5645043" | "6029664" | "6138675" | "6229581").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:13
S1162	462	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3 OR signal$3 OR wave OR waveform OR data OR value))) AND (("600"/$) OR ("128"/$)).ccls.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:13
S1163	244	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3 OR signal$3 OR wave OR waveform OR data OR value))) AND ((sleep$3 NEAR8 (disorder OR illness OR condition OR obstructi$4)) OR apne$3 OR hypoapne$3 OR hyperapne$3 OR hypopne$3) AND (("600"/$) OR ("128"/$)).ccls.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:13
S1164	244	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME (adjust$4 OR control$4 OR regulat$4 OR chang$3))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:14

		SAME (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3 OR signal$3 OR wave OR waveform OR data OR value))) AND S1163				
S1165	20	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$).did.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:14
S1166	0	(quantitative$3) AND (realtime OR (real ADJ2 time)) AND S1165	US-PGPUB; USPAT	OR	ON	2022/05/19 18:14
S1167	7	(realtime OR (real ADJ2 time)) AND S1165	US-PGPUB; USPAT	OR	ON	2022/05/19 18:14
S1168	4	(quantitative$3) AND S1165	US-PGPUB; USPAT	OR	ON	2022/05/19 18:14
S1169	5	("20050217674" | "5645043" | "6029664" | "6138675" | "6229581").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:14
S1170	20	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$).did.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:14
S1171	15	S1170 NOT S1169	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:15
S1172	184	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME (adjust$4 OR control$4 OR regulat$4 OR chang$3))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:15

		AND ((respir$6 OR breath$3 OR thorac$3 OR chest OR lung OR breast OR torso OR abdom$5) WITH (belt OR strap OR vest OR garment OR cloth$3)) AND ((pulse OR oximet$4 OR oxymet$4) WITH (sensor$3 OR sensing OR measur$6 OR detect$5 OR monitor$3 OR transducer OR probe)) AND (sleep$3 WITH (disorder OR condition OR disease OR illness OR apne$3 OR symptom)) AND ((600/529-543,484) OR ("128"/$)).ccls.				
S1173	184	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME (adjust$4 OR control$4 OR regulat$4 OR chang$3)) AND ((pulse OR oximet$4 OR oxymet$4) WITH (sensor$3 OR sensing OR measur$6 OR detect$5 OR monitor$3 OR transducer OR probe)) AND S1172	US-PGPUB; USPAT	OR	ON	2022/05/19 18:15
S1174	170	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) AND ((respir$6 OR breath$3 OR thorac$3 OR chest OR lung OR breast OR torso OR abdom$5) SAME (belt OR strap OR vest OR garment OR cloth$3)) AND ((pulse OR oximet$4 OR oxymet$4 OR saturation) WITH (sensor$3 OR sensing OR measur$6 OR detect$5 OR monitor$3 OR transducer OR probe)) AND (sleep$3 WITH (disorder OR condition OR disease OR illness OR apne$3 OR symptom)) AND ((600/529-543,484) OR ("128"/$)).ccls.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:15
S1175	170	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) AND ((pulse OR oximet$4 OR oxymet$4 OR saturation) WITH (sensor$3 OR sensing OR measur$6 OR detect$5 OR monitor$3 OR transducer OR probe)) AND (sleep$3 WITH (disorder OR condition OR disease OR illness OR apne$3 OR symptom)) AND S1174	US-PGPUB; USPAT	OR	ON	2022/05/19 18:15

S1176	1	(US-20050115561-$).did.	US-PGPUB	OR	ON	2022/05/19 18:15
S1177	1	S1176 AND ((respir$6 OR breath$3 OR thorac$3 OR chest OR lung OR breast OR torso OR abdom$5) SAME (belt OR strap OR vest OR garment OR cloth$3))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:15
S1178	1	S1176 AND ((respir$6 OR breath$3 OR thorac$3 OR chest OR lung OR breast OR torso OR abdom$5) WITH (sensor$3 OR sensing OR detector OR probe OR monitor OR transducer))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:16
S1179	1	(US-20050115561-$).did.	US-PGPUB	OR	ON	2022/05/19 18:16
S1180	1	S1179 AND ((pulse OR oximet$4 OR oxymet$4 OR saturation) WITH (sensor$3 OR sensing OR measur$6 OR detect$5 OR monitor$3 OR transducer OR probe))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:16
S1181	1	S1179 AND (realtime OR (real ADJ2 time))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:16
S1182	1	S1179 AND (wireless$3 OR transmi$6 OR transceiver OR communicat$5)	US-PGPUB; USPAT	OR	ON	2022/05/19 18:16
S1183	1	S1179 AND (wireless$3)	US-PGPUB; USPAT	OR	ON	2022/05/19 18:17
S1184	1	S1179 AND ("EEG" OR electroenceph$ OR brain OR brainwave$5)	US-PGPUB; USPAT	OR	ON	2022/05/19 18:17
S1185	1	S1179 AND ("ECG" OR "EKG" OR electrocardiograph$)	US-PGPUB; USPAT	OR	ON	2022/05/19 18:17
S1186	5	("20050217674" | "5645043" | "6029664" | "6138675" | "6229581").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:17
S1187	35	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-	US-PGPUB; USPAT	OR	ON	2022/05/19 18:17

		5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$).did.				
S1188	18	("20030000528" | "20040163648" | "20040254493" | "20050081847" | "20050165323" | "20050217674" | "20050268916" | "20050188991" | "20060247546" | "5645043" | "6029664" | "6138675" | "6229581" | "6431171" | "6889691" | "7190995" | "7204250" | "7575005").PN.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:17
S1189	18	S1187 NOT S1188	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:18
S1190	27	("20030000528" | "20040163648" | "20040254493" | "20050081847" | "20050085738" | "20050115561" | "20050165323" | "20050217674" | "20050268916" | "20050188991" | "20060247546" | "5645043" | "5961447" | "6029664" | "6138675" | "6229581" | "6431171" | "6551252" | "6889691" | "7190995" | "7195013" | "7204250" | "7225809" | "7309314" | "7575005" | "7668579" | "7670295").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:18
S1191	35	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$).did.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:18
S1192	36	S1190 OR S1191	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:18

S1193	27	("20030000528" | "20040163648" | "20040254493" | "20050081847" | "20050085738" | "20050115561" | "20050165323" | "20050217674" | "20050268916" | "20050188991" | "20060247546" | "5645043" | "5961447" | "6029664" | "6138675" | "6229581" | "6431171" | "6551252" | "6889691" | "7190995" | "7195013" | "7204250" | "7225809" | "7309314" | "7575005" | "7668579" | "7670295").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:18
S1194	35	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$).did.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:18
S1195	36	S1193 OR S1194	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:18
S1196	30	S1195 AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) AND (pulse OR pulsewave$5 OR oximet$4 OR oxymet$4) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6) WITH (belt OR strap OR piezoelect$5 OR sensor$3 OR sensing OR transducer OR electrode OR detect$4 OR biosensor$3 OR biosensing OR biotransducer OR bioelectrode OR biodetect$4))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:18

S1197	30	S1196 AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6) WITH (belt OR strap OR piezoelect$5 OR sensor$3 OR sensing OR transducer OR electrode OR detect$4 OR biosensor$3 OR biosensing OR biotransducer OR bioelectrode OR biodetect$4))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:18
S1198	704	(("600"/$) OR ("128"/$)).ccls. AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) AND (pulse OR pulsewave$5 OR oximet$4 OR oxymet$4) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6) SAME (belt OR strap OR piezoelect$5))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:19
S1199	644	(("600"/$) OR ("128"/$)).ccls. AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6) SAME (belt OR strap OR piezoelect$5))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:19
S1200	354	(("600"/$) OR ("128"/$)).ccls. AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR	US-PGPUB; USPAT	OR	ON	2022/05/19 18:19

		biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (movement OR moving OR motion OR expansion OR expand$3 OR compress$4) SAME (belt OR strap OR piezoelect$5))				
S1201	354	S1200 AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (movement OR moving OR motion OR expansion OR expand$3 OR compress$4) SAME (belt OR strap OR piezoelect$5))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:19
S1202	172	(("600"/$) OR ("128"/$)).ccls. AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND (("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5)) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (movement OR moving OR motion OR expansion OR expand$3 OR compress$4) SAME (belt OR strap OR piezoelect$5))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:19
S1203	172	S1202 AND (("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:19

		AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (movement OR moving OR motion OR expansion OR expand$3 OR compress$4) SAME (belt OR strap OR piezoelect$5))				
S1204	31	(("600"/$) OR ("128"/$)).ccls. AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND ((("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5)) SAME (pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR saturation) SAME (respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (movement OR moving OR motion OR expansion OR expand$3 OR compress$4) SAME (belt OR strap OR piezoelect$5))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:20
S1205	31	S1204 AND ((("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5)) SAME (pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR saturation) SAME (respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (movement OR moving OR motion OR expansion OR expand$3 OR compress$4) SAME (belt OR strap OR piezoelect$5))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:20
S1206	13	S1195 AND (("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR	US-PGPUB; USPAT	OR	ON	2022/05/19 18:20

		regulat$5 OR control$5 OR set$5)) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR saturation) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (belt OR strap OR piezoelect$5))				
S1207	413	(("600"/$) OR ("128"/$)).ccls. AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND (("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5)) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR saturation) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (belt OR strap OR piezoelect$5 OR vest OR band))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:20
S1208	413	S1207 AND (("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5)) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR saturation) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (belt OR strap OR piezoelect$5 OR vest OR band))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:20

S1209	45	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$).did.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:20
S1210	26	((diagnosis OR diagnose OR diagnosing OR sever$6 OR evaluat$5 OR output$5) WITH sleep$4 WITH (disorder OR symptoms OR abnormal$5 OR illness OR apnea OR apneic OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND S1209	US-PGPUB; USPAT	OR	ON	2022/05/19 18:21
S1211	37	(transmi$6 OR transceiv$5 OR wireless$3 OR radio OR radiofrequenc$3 OR antenna OR telemet$4) AND S1209	US-PGPUB; USPAT	OR	ON	2022/05/19 18:21
S1212	18	((transmi$6 OR transceiv$5 OR wireless$3 OR radio OR radiofrequenc$3 OR antenna OR telemet$4) SAME ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator)) AND S1209	US-PGPUB; USPAT	OR	ON	2022/05/19 18:21
S1213	1,007	(("600"/$) OR ("128"/$)).ccls. AND ((transmi$6 OR transceiv$5 OR wireless$3 OR radio OR radiofrequenc$3 OR antenna OR	US-PGPUB; USPAT	OR	ON	2022/05/19 18:21

		telemet$4) SAME ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator)) AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND (adjust$6 OR regulat$5 OR control$5 OR set$5)				
S1214	302	(("600"/$) OR ("128"/$)).ccls. AND ((transmi$6 OR transceiv$5 OR wireless$3 OR radio OR radiofrequenc$3 OR antenna OR telemet$4) SAME ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator)) AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND (adjust$6 OR regulat$5 OR control$5 OR set$5)AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR saturation) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (belt OR strap OR piezoelect$5 OR vest OR band))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:21
S1215	302	(("600"/$) OR ("128"/$)).ccls. AND ((transmi$6 OR transceiv$5 OR wireless$3 OR radio OR radiofrequenc$3 OR antenna OR telemet$4) SAME ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator)) AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND (adjust$6 OR regulat$5 OR control$5 OR set$5) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR saturation) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR	US-PGPUB; USPAT	OR	ON	2022/05/19 18:22

		biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (belt OR strap OR piezoelect$5 OR vest OR band))				
S1216	302	S1215 AND ((transmi$6 OR transceiv$5 OR wireless$3 OR radio OR radiofrequenc$3 OR antenna OR telemet$4) SAME ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (belt OR strap OR piezoelect$5 OR vest OR band))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:22
S1217	302	S1215 AND ((transmi$6 OR transceiv$5 OR wireless$3 OR radio OR radiofrequenc$3 OR antenna OR telemet$4) SAME ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:22
S1218	435	(("600"/$) OR ("128"/$)).ccls. AND (("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5)) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (belt OR strap OR piezoelect$5))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:22
S1219	684	(("600"/$) OR ("128"/$)).ccls. AND (("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5)) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR saturation) WITH	US-PGPUB; USPAT	OR	ON	2022/05/19 18:22

		(detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (belt OR strap OR piezoelect$5 OR vest OR band))				
S1220	684	S1219 AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR saturation) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (belt OR strap OR piezoelect$5 OR vest OR band))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:23
S1221	1	("20020185130").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:23
S1222	27	("20030000528" | "20040163648" | "20040254493" | "20050081847" | "20050085738" | "20050115561" | "20050165323" | "20050217674" | "20050268916" | "20050188991" | "20060247546" | "5645043" | "5961447" | "6029664" | "6138675" | "6229581" | "6431171" | "6551252" | "6889691" | "7190995" | "7195013" | "7204250" | "7225809" | "7309314" | "7575005" | "7668579" | "7670295").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:23
S1223	15	((jonathan NEAR2 wright) OR (anthony NEAR2 ujhazy)).inv. AND CPAP AND pulse AND (respiratory ADJ2 movement)	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:23
S1224	15	S1223 AND (sleep$3 WITH (disorder OR symptom OR condition OR illness))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:23
S1225	0	S1223 AND (realtime OR (real ADJ2 time))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:23
S1226	15	S1223 AND (nebuliz$3 OR medication OR medicine OR drug OR agent)	US-PGPUB; USPAT	OR	ON	2022/05/19 18:24
S1227	50	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$	US-PGPUB; USPAT	OR	ON	2022/05/19 18:24

		or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-20100258126-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$ or US-7662101-$ or US-7878198-$).did.				
S1228	24	S1227 NOT S1222	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:24
S1229	50	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-20100258126-$).did. or (US-7575005-	US-PGPUB; USPAT	OR	ON	2022/05/19 18:24

		$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$ or US-7662101-$ or US-7878198-$).did.				
S1230	34	("20020185130" | "20030000528" | "20040138576" | "20040163648" | "20040254493" | "20050081847" | "20050085738" | "20050115561" | "20050165323" | "20050217674" | "20050268916" | "20050188991" | "20060084877" | "20060247546" | "5645043" | "5961447" | "6029664" | "6138675" | "6229581" | "6431171" | "6551252" | "6832609" | "6889691" | "7018341" | "7190995" | "7195013" | "7204250" | "7225809" | "7309314" | "7575005" | "7662101" | "7668579" | "7670295" | "7878198").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:24
S1231	51	S1229 OR S1230	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:24
S1232	31	((severit$4 OR level OR depth OR stag$3) WITH (apne$4 OR hypopne$5 OR hypoapne$5 OR hyperapne$5)) AND S1231	US-PGPUB; USPAT	OR	ON	2022/05/19 18:24
S1233	31	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (signal$3 OR data OR sens$5 OR information OR parameter)) AND (apne$4 OR hypopne$5 OR hypoapne$5 OR hyperapne$5) AND S1231	US-PGPUB; USPAT	OR	ON	2022/05/19 18:24
S1234	31	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (signal$3 OR data OR sens$5 OR information OR parameter)) AND S1233	US-PGPUB; USPAT	OR	ON	2022/05/19 18:25
S1235	9	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:25

		SAME (signal$3 OR data OR sens$5 OR information OR parameter)) AND ((apne$4 OR hypopne$5 OR hypoapne$5 OR hyperapne$5) WITH (index OR indices)) AND S1231				
S1236	6	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME ((radio OR radiofrequenc$3 OR "RF" OR wireless$3) WITH (transmi$6 OR transceiv$3 OR telemet$5 OR communicat$5 OR receiv$3 OR antenna))) AND S1231	US-PGPUB; USPAT	OR	ON	2022/05/19 18:25
S1237	0	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME ((radio OR radiofrequenc$3 OR "RF" OR wireless$3) WITH (transmi$6 OR transceiv$3 OR telemet$5 OR communicat$5 OR receiv$3 OR antenna)) SAME acquistion) AND (600/484,529-543).ccls.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:25
S1238	181	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME ((radio OR radiofrequenc$3 OR "RF" OR wireless$3) WITH (transmi$6 OR transceiv$3 OR telemet$5 OR communicat$5 OR receiv$3 OR antenna))) AND (apne$4 OR hypopne$5 OR hypoapne$5 OR hyperapne$5) AND ((600/484,529-543) OR (128/204.21-204.26)).ccls.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:25
S1239	181	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME ((radio OR radiofrequenc$3 OR "RF" OR wireless$3) WITH (transmi$6 OR transceiv$3 OR telemet$5 OR communicat$5 OR receiv$3 OR antenna))) AND S1238	US-PGPUB; USPAT	OR	ON	2022/05/19 18:26
S1240	7,486	((KAYYALI NEAR2 HANI) OR (SCHMIDT NEAR2 ROBERT) OR ((("MODARRES-ZADEH") OR (MODARRES ADJ2 ZADEH)) NEAR2 MOHAMMAD) OR (KOLKOWSKI NEAR2 BRIAN)).INV.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2022/05/19 18:26
S1241	1,608	("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) AND ("EEG" OR	US-PGPUB; USPAT	OR	ON	2022/05/19 18:26

		electroencephal$6 OR ((brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3))) AND ((sleep$3 NEAR8 (disorder OR illness OR condition OR obstructi$4)) OR apne$3 OR hypoapne$3 OR hyperapne$3 OR hypopne$3) AND (("600"/$) OR ("128"/$)).ccls.				
S1242	1,002	("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) AND (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3)) AND (((sleep$3 NEAR8 (disorder OR illness OR condition OR obstructi$4)) OR apne$3 OR hypoapne$3 OR hyperapne$3 OR hypopne$3) SAME (treat$5 OR therap$6)) AND (("600"/$) OR ("128"/$)).ccls.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:26
S1243	623	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) AND (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3)) AND (((sleep$3 NEAR8 (disorder OR illness OR condition OR obstructi$4)) OR apne$3 OR hypoapne$3 OR hyperapne$3 OR hypopne$3) SAME (treat$5 OR therap$6)) AND (("600"/$) OR ("128"/$)).ccls.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:27
S1244	131	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR	US-PGPUB; USPAT	OR	ON	2022/05/19 18:27

		control$4 OR regulat$4 OR chang$3)) SAME (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3))) AND (((sleep$3 NEAR8 (disorder OR illness OR condition OR obstructi$4)) OR apne$3 OR hypoapne$3 OR hyperapne$3 OR hypopne$3) SAME (treat$5 OR therap$6)) AND (("600"/$) OR ("128"/$)).ccls.				
S1245	131	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3))) AND S1244	US-PGPUB; USPAT	OR	ON	2022/05/19 18:27
S1246	141	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3 OR signal$3 OR wave OR waveform OR data OR value))) AND (((sleep$3 NEAR8 (disorder OR illness OR condition OR obstructi$4)) OR apne$3 OR hypoapne$3 OR hyperapne$3 OR hypopne$3) SAME (treat$5 OR therap$6)) AND (("600"/$) OR ("128"/$)).ccls.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:27
S1247	141	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (("EEG" OR electroencephal$6	US-PGPUB; USPAT	OR	ON	2022/05/19 18:27

		OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3 OR signal$3 OR wave OR waveform OR data OR value))) AND S1246				
S1248	5	("20050217674" | "5645043" | "6029664" | "6138675" | "6229581").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:27
S1249	462	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3 OR signal$3 OR wave OR waveform OR data OR value))) AND (("600"/$) OR ("128"/$)).ccls.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:28
S1250	244	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3 OR signal$3 OR wave OR waveform OR data OR value))) AND ((sleep$3 NEAR8 (disorder OR illness OR condition OR obstructi$4)) OR apne$3 OR hypoapne$3 OR hyperapne$3 OR hypopne$3) AND (("600"/$) OR ("128"/$)).ccls.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:28
S1251	244	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (("EEG" OR electroencephal$6 OR brain OR scalp OR head OR brainwave$5) WITH (electrode OR	US-PGPUB; USPAT	OR	ON	2022/05/19 18:28

		sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3 OR signal$3 OR wave OR waveform OR data OR value))) AND S1250				
S1252	20	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$).did.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:28
S1253	0	(quantitative$3) AND (realtime OR (real ADJ2 time)) AND S1252	US-PGPUB; USPAT	OR	ON	2022/05/19 18:28
S1254	7	(realtime OR (real ADJ2 time)) AND S1252	US-PGPUB; USPAT	OR	ON	2022/05/19 18:29
S1255	4	(quantitative$3) AND S1252	US-PGPUB; USPAT	OR	ON	2022/05/19 18:29
S1256	5	("20050217674" | "5645043" | "6029664" | "6138675" | "6229581").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:29
S1257	20	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$).did.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:29
S1258	15	S1257 NOT S1256	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:29
S1259	184	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME (adjust$4 OR control$4 OR regulat$4 OR chang$3)) AND ((respir$6 OR breath$3 OR thorac$3 OR chest OR lung OR breast OR torso OR abdom$5) WITH (belt OR	US-PGPUB; USPAT	OR	ON	2022/05/19 18:29

		strap OR vest OR garment OR cloth$3)) AND ((pulse OR oximet$4 OR oxymet$4) WITH (sensor$3 OR sensing OR measur$6 OR detect$5 OR monitor$3 OR transducer OR probe)) AND (sleep$3 WITH (disorder OR condition OR disease OR illness OR apne$3 OR symptom)) AND ((600/529-543,484) OR ("128"/$)).ccls.				
S1260	184	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME (adjust$4 OR control$4 OR regulat$4 OR chang$3)) AND ((pulse OR oximet$4 OR oxymet$4) WITH (sensor$3 OR sensing OR measur$6 OR detect$5 OR monitor$3 OR transducer OR probe)) AND S1259	US-PGPUB; USPAT	OR	ON	2022/05/19 18:29
S1261	170	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) AND ((respir$6 OR breath$3 OR thorac$3 OR chest OR lung OR breast OR torso OR abdom$5) SAME (belt OR strap OR vest OR garment OR cloth$3)) AND ((pulse OR oximet$4 OR oxymet$4 OR saturation) WITH (sensor$3 OR sensing OR measur$6 OR detect$5 OR monitor$3 OR transducer OR probe)) AND (sleep$3 WITH (disorder OR condition OR disease OR illness OR apne$3 OR symptom)) AND ((600/529-543,484) OR ("128"/$)).ccls.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:30
S1262	170	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) AND ((pulse OR oximet$4 OR oxymet$4 OR saturation) WITH (sensor$3 OR sensing OR measur$6 OR detect$5 OR monitor$3 OR transducer OR probe)) AND (sleep$3 WITH (disorder OR condition OR disease OR illness OR apne$3 OR symptom)) AND S1261	US-PGPUB; USPAT	OR	ON	2022/05/19 18:30
S1263	1	(US-20050115561-$).did.	US-PGPUB	OR	ON	2022/05/19 18:30

S1264	1	S1263 AND ((respir$6 OR breath$3 OR thorac$3 OR chest OR lung OR breast OR torso OR abdom$5) SAME (belt OR strap OR vest OR garment OR cloth$3))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:30
S1265	1	S1263 AND ((respir$6 OR breath$3 OR thorac$3 OR chest OR lung OR breast OR torso OR abdom$5) WITH (sensor$3 OR sensing OR detector OR probe OR monitor OR transducer))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:30
S1266	1	(US-20050115561-$).did.	US-PGPUB	OR	ON	2022/05/19 18:30
S1267	1	S1266 AND ((pulse OR oximet$4 OR oxymet$4 OR saturation) WITH (sensor$3 OR sensing OR measur$6 OR detect$5 OR monitor$3 OR transducer OR probe))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:31
S1268	1	S1266 AND (realtime OR (real ADJ2 time))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:31
S1269	1	S1266 AND (wireless$3 OR transmi$6 OR transceiver OR communicat$5)	US-PGPUB; USPAT	OR	ON	2022/05/19 18:31
S1270	1	S1266 AND (wireless$3)	US-PGPUB; USPAT	OR	ON	2022/05/19 18:31
S1271	1	S1266 AND ("EEG" OR electroenceph$ OR brain OR brainwave$5)	US-PGPUB; USPAT	OR	ON	2022/05/19 18:32
S1272	1	S1266 AND ("ECG" OR "EKG" OR electrocardiograph$)	US-PGPUB; USPAT	OR	ON	2022/05/19 18:32
S1273	5	("20050217674" | "5645043" | "6029664" | "6138675" | "6229581").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:32
S1274	35	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-	US-PGPUB; USPAT	OR	ON	2022/05/19 18:32

		7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$).did.				
S1275	18	("20030000528" | "20040163648" | "20040254493" | "20050081847" | "20050165323" | "20050217674" | "20050268916" | "20050188991" | "20060247546" | "5645043" | "6029664" | "6138675" | "6229581" | "6431171" | "6889691" | "7190995" | "7204250" | "7575005").PN.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:32
S1276	18	S1274 NOT S1275	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:33
S1277	27	("20030000528" | "20040163648" | "20040254493" | "20050081847" | "20050085738" | "20050115561" | "20050165323" | "20050217674" | "20050268916" | "20050188991" | "20060247546" | "5645043" | "5961447" | "6029664" | "6138675" | "6229581" | "6431171" | "6551252" | "6889691" | "7190995" | "7195013" | "7204250" | "7225809" | "7309314" | "7575005" | "7668579" | "7670295").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:33
S1278	35	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$).did.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:33
S1279	36	S1277 OR S1278	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:33
S1280	27	("20030000528" | "20040163648" | "20040254493" | "20050081847" |	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:33

		"20050085738" | "20050115561" | "20050165323" | "20050217674" | "20050268916" | "20050188991" | "20060247546" | "5645043" | "5961447" | "6029664" | "6138675" | "6229581" | "6431171" | "6551252" | "6889691" | "7190995" | "7195013" | "7204250" | "7225809" | "7309314" | "7575005" | "7668579" | "7670295").PN.				
S1281	35	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$).did.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:33
S1282	36	S1280 OR S1281	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:33
S1283	30	S1282 AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) AND (pulse OR pulsewave$5 OR oximet$4 OR oxymet$4) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6) WITH (belt OR strap OR piezoelect$5 OR sensor$3 OR sensing OR transducer OR electrode OR detect$4 OR biosensor$3 OR biosensing OR biotransducer OR bioelectrode OR biodetect$4))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:33
S1284	30	S1283 AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6) WITH (belt OR	US-PGPUB; USPAT	OR	ON	2022/05/19 18:34

		strap OR piezoelect$5 OR sensor$3 OR sensing OR transducer OR electrode OR detect$4 OR biosensor$3 OR biosensing OR biotransducer OR bioelectrode OR biodetect$4))				
S1285	704	(("600"/$) OR ("128"/$)).ccls. AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) AND (pulse OR pulsewave$5 OR oximet$4 OR oxymet$4) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6) SAME (belt OR strap OR piezoelect$5))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:34
S1286	644	(("600"/$) OR ("128"/$)).ccls. AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6) SAME (belt OR strap OR piezoelect$5))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:34
S1287	354	(("600"/$) OR ("128"/$)).ccls. AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND	US-PGPUB; USPAT	OR	ON	2022/05/19 18:34

		((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (movement OR moving OR motion OR expansion OR expand$3 OR compress$4) SAME (belt OR strap OR piezoelect$5))				
S1288	354	S1287 AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (movement OR moving OR motion OR expansion OR expand$3 OR compress$4) SAME (belt OR strap OR piezoelect$5))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:34
S1289	172	(("600"/$) OR ("128"/$)).ccls. AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND (("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5)) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (movement OR moving OR motion OR expansion OR expand$3 OR compress$4) SAME (belt OR strap OR piezoelect$5))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:34
S1290	172	S1289 AND (("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5)) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4) WITH	US-PGPUB; USPAT	OR	ON	2022/05/19 18:35

		(detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (movement OR moving OR motion OR expansion OR expand$3 OR compress$4) SAME (belt OR strap OR piezoelect$5))				
S1291	31	(("600"/$) OR ("128"/$)).ccls. AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND ((("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5)) SAME (pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR saturation) SAME (respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (movement OR moving OR motion OR expansion OR expand$3 OR compress$4) SAME (belt OR strap OR piezoelect$5))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:35
S1292	31	S1291 AND ((("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5)) SAME (pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR saturation) SAME (respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (movement OR moving OR motion OR expansion OR expand$3 OR compress$4) SAME (belt OR strap OR piezoelect$5))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:35
S1293	13	S1282 AND (("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5)) AND ((pulse OR pulsewave$5 OR	US-PGPUB; USPAT	OR	ON	2022/05/19 18:35

		oximet$4 OR oxymet$4 OR saturation) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (belt OR strap OR piezoelect$5))				
S1294	413	(("600"/$) OR ("128"/$)).ccls. AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND (("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5)) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR saturation) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (belt OR strap OR piezoelect$5 OR vest OR band))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:35
S1295	413	S1294 AND (("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5)) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR saturation) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (belt OR strap OR piezoelect$5 OR vest OR band))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:36
S1296	45	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$	US-PGPUB; USPAT	OR	ON	2022/05/19 18:36

		or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$).did.				
S1297	26	((diagnosis OR diagnose OR diagnosing OR sever$6 OR evaluat$5 OR output$5) WITH sleep$4 WITH (disorder OR symptoms OR abnormal$5 OR illness OR apnea OR apneic OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND S1296	US-PGPUB; USPAT	OR	ON	2022/05/19 18:36
S1298	37	(transmi$6 OR transceiv$5 OR wireless$3 OR radio OR radiofrequenc$3 OR antenna OR telemet$4) AND S1296	US-PGPUB; USPAT	OR	ON	2022/05/19 18:36
S1299	18	((transmi$6 OR transceiv$5 OR wireless$3 OR radio OR radiofrequenc$3 OR antenna OR telemet$4) SAME ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator)) AND S1296	US-PGPUB; USPAT	OR	ON	2022/05/19 18:36
S1300	1,007	(("600"/$) OR ("128"/$)).ccls. AND ((transmi$6 OR transceiv$5 OR wireless$3 OR radio OR radiofrequenc$3 OR antenna OR telemet$4) SAME ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2	US-PGPUB; USPAT	OR	ON	2022/05/19 18:37

		pressure) OR ventilation OR ventilator OR respirator)) AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND (adjust$6 OR regulat$5 OR control$5 OR set$5)				
S1301	302	(("600"/$) OR ("128"/$)).ccls. AND ((transmi$6 OR transceiv$5 OR wireless$3 OR radio OR radiofrequenc$3 OR antenna OR telemet$4) SAME ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator)) AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND (adjust$6 OR regulat$5 OR control$5 OR set$5)AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR saturation) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (belt OR strap OR piezoelect$5 OR vest OR band))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:37
S1302	302	(("600"/$) OR ("128"/$)).ccls. AND ((transmi$6 OR transceiv$5 OR wireless$3 OR radio OR radiofrequenc$3 OR antenna OR telemet$4) SAME ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator)) AND (sleep$4 WITH (disorder OR abnormal$5 OR apne$4 OR hypoapne$5 OR hyperapne$5 OR illness OR disease OR condition$3)) AND (adjust$6 OR regulat$5 OR control$5 OR set$5) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR saturation) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND	US-PGPUB; USPAT	OR	ON	2022/05/19 18:37

		((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (belt OR strap OR piezoelect$5 OR vest OR band))				
S1303	302	S1302 AND ((transmi$6 OR transceiv$5 OR wireless$3 OR radio OR radiofrequenc$3 OR antenna OR telemet$4) SAME ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (belt OR strap OR piezoelect$5 OR vest OR band))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:37
S1304	302	S1302 AND ((transmi$6 OR transceiv$5 OR wireless$3 OR radio OR radiofrequenc$3 OR antenna OR telemet$4) SAME ("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:37
S1305	435	(("600"/$) OR ("128"/$)).ccls. AND (("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5)) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (belt OR strap OR piezoelect$5))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:38
S1306	684	(("600"/$) OR ("128"/$)).ccls. AND (("CPAP" OR "PAP" OR (positiv$4 ADJ2 airway ADJ2 pressure) OR ventilation OR ventilator OR respirator) WITH (adjust$6 OR regulat$5 OR control$5 OR set$5)) AND ((pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR saturation) WITH (detect$5 OR sensor$3 OR sensing OR transducer OR meter$3 OR probe OR	US-PGPUB; USPAT	OR	ON	2022/05/19 18:38

		monitor$3 OR biodetect$5 OR biosensor$3 OR biosensing OR biotransducer OR biometer$3)) AND ((respir$6 OR breath$3 OR exhal$6 OR expir$6 OR pulmonar$3 OR lung OR chest OR torso OR abdomen) SAME (belt OR strap OR piezoelect$5 OR vest OR band))				
S1308	1	("20020185130").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:38
S1309	27	("20030000528" | "20040163648" | "20040254493" | "20050081847" | "20050085738" | "20050115561" | "20050165323" | "20050217674" | "20050268916" | "20050188991" | "20060247546" | "5645043" | "5961447" | "6029664" | "6138675" | "6229581" | "6431171" | "6551252" | "6889691" | "7190995" | "7195013" | "7204250" | "7225809" | "7309314" | "7575005" | "7668579" | "7670295").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:38
S1310	15	((jonathan NEAR2 wright) OR (anthony NEAR2 ujhazy)).inv. AND CPAP AND pulse AND (respiratory ADJ2 movement)	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:39
S1311	15	S1310 AND (sleep$3 WITH (disorder OR symptom OR condition OR illness))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:39
S1312	0	S1310 AND (realtime OR (real ADJ2 time))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:39
S1313	15	S1310 AND (nebuliz$3 OR medication OR medicine OR drug OR agent)	US-PGPUB; USPAT	OR	ON	2022/05/19 18:39
S1314	50	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-	US-PGPUB; USPAT	OR	ON	2022/05/19 18:39

		20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-20100258126-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$ or US-7662101-$ or US-7878198-$).did.				
S1315	24	S1314 NOT S1309	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:40
S1316	50	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-20100258126-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$ or US-7662101-$ or US-7878198-$).did.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:40
S1317	34	("20020185130" | "20030000528" | "20040138576" | "20040163648" | "20040254493" | "20050081847" | "20050085738" | "20050115561" | "20050165323" | "20050217674" |	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:40

		"20050268916" | "20050188991" | "20060084877" | "20060247546" | "5645043" | "5961447" | "6029664" | "6138675" | "6229581" | "6431171" | "6551252" | "6832609" | "6889691" | "7018341" | "7190995" | "7195013" | "7204250" | "7225809" | "7309314" | "7575005" | "7662101" | "7668579" | "7670295" | "7878198").PN.				
S1318	51	S1316 OR S1317	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:40
S1319	31	((severit$4 OR level OR depth OR stag$3) WITH (apne$4 OR hypopne$5 OR hypoapne$5 OR hyperapne$5)) AND S1318	US-PGPUB; USPAT	OR	ON	2022/05/19 18:40
S1320	31	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (signal$3 OR data OR sens$5 OR information OR parameter)) AND (apne$4 OR hypopne$5 OR hypoapne$5 OR hyperapne$5) AND S1318	US-PGPUB; USPAT	OR	ON	2022/05/19 18:40
S1321	31	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (signal$3 OR data OR sens$5 OR information OR parameter)) AND S1320	US-PGPUB; USPAT	OR	ON	2022/05/19 18:41
S1322	9	((("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (adjust$4 OR control$4 OR regulat$4 OR chang$3)) SAME (signal$3 OR data OR sens$5 OR information OR parameter)) AND ((apne$4 OR hypopne$5 OR hypoapne$5 OR hyperapne$5) WITH (index OR indices)) AND S1318	US-PGPUB; USPAT	OR	ON	2022/05/19 18:41
S1323	6	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME ((radio OR radiofrequenc$3 OR "RF" OR wireless$3) WITH (transmi$6 OR transceiv$3 OR telemet$5 OR communicat$5 OR receiv$3 OR antenna))) AND S1318	US-PGPUB; USPAT	OR	ON	2022/05/19 18:41
S1324	0	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4	US-PGPUB; USPAT	OR	ON	2022/05/19 18:41

		OR respirator) SAME ((radio OR radiofrequenc$3 OR "RF" OR wireless$3) WITH (transmi$6 OR transceiv$3 OR telemet$5 OR communicat$5 OR receiv$3 OR antenna)) SAME acquistion) AND (600/484,529-543).ccls.				
S1325	181	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME ((radio OR radiofrequenc$3 OR "RF" OR wireless$3) WITH (transmi$6 OR transceiv$3 OR telemet$5 OR communicat$5 OR receiv$3 OR antenna))) AND (apne$4 OR hypopne$5 OR hypoapne$5 OR hyperapne$5) AND ((600/484,529-543) OR (128/204.21-204.26)).ccls.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:41
S1326	181	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) SAME ((radio OR radiofrequenc$3 OR "RF" OR wireless$3) WITH (transmi$6 OR transceiv$3 OR telemet$5 OR communicat$5 OR receiv$3 OR antenna))) AND S1325	US-PGPUB; USPAT	OR	ON	2022/05/19 18:42
S1327	35	("20050165323" | "6889691" | "7204250" | "20050085738" | "6551252" | "7309314" | "6029664" | "20040254493" | "7575005" | "7670295" | "7662101" | "7101341" | "6138675" | "20050217674" | "20040163648" | "20050081847" | "20040138576" | "20060084877" | "7878198" | "5645043" | "20030000528" | "20050268916" | "20060247546" | "7190995" | "20050188991" | "7668579" | "7018341" | "20050115561" | "5961447" | "7195013" | "7225809" | "20020185130" | "6229581" | "6431171" | "6832609").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:42
S1328	5	(("7190995") or ("20050115561") or ("20020185130") or ("7878198") or ("7101341")).PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:42
S1329	1	(US-7878198-$).did.	USPAT	OR	ON	2022/05/19 18:42
S1330	1	S1329 AND ((determin$6 OR calculat$4 OR compute OR computing	US-PGPUB; USPAT	OR	ON	2022/05/19 18:42

		OR output$4 OR derive OR deriving) WITH pressure)				
S1331	0	S1329 AND ("FFT" OR fourier)	US-PGPUB; USPAT	OR	ON	2022/05/19 18:43
S1332	1	S1328 AND ("FFT" OR fourier)	US-PGPUB; USPAT	OR	ON	2022/05/19 18:43
S1333	0	S1329 AND ((atmospher$5 OR environment OR baromet$5) WITH (level OR pressure OR concentration))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:43
S1334	1	S1329 AND (oxygen OR carbon OR "O2" OR "CO2")	US-PGPUB; USPAT	OR	ON	2022/05/19 18:43
S1335	50	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-20100258126-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$ or US-7662101-$ or US-7878198-$).did.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:43
S1336	35	("20050165323" | "6889691" | "7204250" | "20050085738" | "6551252" | "7309314" | "6029664" | "20040254493" | "7575005" | "7670295" | "7662101" | "7101341" | "6138675" | "20050217674" | "20040163648" | "20050081847" | "20040138576" | "20060084877" |	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:43

		"7878198" | "5645043" | "20030000528" | "20050268916" | "20060247546" | "7190995" | "20050188991" | "7668579" | "7018341" | "20050115561" | "5961447" | "7195013" | "7225809" | "20020185130" | "6229581" | "6431171" | "6832609").PN.				
S1337	52	S1335 OR S1336	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:44
S1338	15	S1337 AND ("FFT" OR fourier)	US-PGPUB; USPAT	OR	ON	2022/05/19 18:44
S1339	0	S1329 AND (burton)	US-PGPUB; USPAT	OR	ON	2022/05/19 18:44
S1340	1	S1329 AND (berthon)	US-PGPUB; USPAT	OR	ON	2022/05/19 18:44
S1341	1	("11165705").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:45
S1342	3	(("5704345") or ("6152129") or ("6532959")).PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:45
S1343	1	S1342 AND ("FFT" OR fourier)	US-PGPUB; USPAT	OR	ON	2022/05/19 18:45
S1344	0	S1342 AND ((oxygen OR carbon OR "O2" OR "CO2") WITH (deliver$4 OR administer$4 OR administrat$4 OR provid$4 OR pump$3))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:45
S1345	15	S1337 AND ((oxygen OR carbon OR "O2" OR "CO2") WITH (deliver$4 OR administer$4 OR administrat$4 OR provid$4 OR pump$3))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:45
S1346	12	S1337 AND (((oxygen OR carbon OR "O2" OR "CO2") WITH (deliver$4 OR administer$4 OR administrat$4 OR provid$4 OR pump$3)) SAME ("CPAP" OR "PAP" OR (positive$3 ADJ4 pressure)))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:46
S1347	11	S1337 AND (((oxygen OR carbon OR "O2" OR "CO2") WITH (deliver$4 OR administer$4 OR administrat$4 OR provid$4 OR pump$3)) AND ("CPAP" OR "PAP" OR (positive$3 ADJ2 airway ADJ2 pressure)))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:46
S1348	1	(US-20050217674-$).did.	US-PGPUB	OR	ON	2022/05/19 18:46
S1349	1	S1348 AND ((oxygen OR gas OR carbon OR "O2" OR "CO2") WITH (deliver$4 OR administer$4 OR	US-PGPUB; USPAT	OR	ON	2022/05/19 18:46

		administrat$4 OR provid$4 OR pump$3 OR pressuriz$6))				
S1350	35	("20050165323" | "6889691" | "7204250" | "20050085738" | "6551252" | "7309314" | "6029664" | "20040254493" | "7575005" | "7670295" | "7662101" | "7101341" | "6138675" | "20050217674" | "20040163648" | "20050081847" | "20040138576" | "20060084877" | "7878198" | "5645043" | "20030000528" | "20050268916" | "20060247546" | "7190995" | "20050188991" | "7668579" | "7018341" | "20050115561" | "5961447" | "7195013" | "7225809" | "20020185130" | "6229581" | "6431171" | "6832609").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:46
S1351	8	"11266899"	US-PGPUB; USPAT	OR	ON	2022/05/19 18:47
S1352	1	("11266899").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:47
S1353	36	S1350 OR S1352	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:47
S1354	2	(("11266899") or ("13440116")).PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:47
S1355	1	(US-8172766-$).did.	USPAT	OR	ON	2022/05/19 18:47
S1356	28,827	(A61B5/02055 OR A61B5/085 OR A61B5/4815 OR A61M16/0051 OR A61M16/0069 OR A61M2016/0027 OR A61M2016/0039 OR A61M2202/0208 OR A61M2205/3553 OR A61M2205/3561 OR A61M2205/3584 OR A61M2205/3592 OR A61M2230/04 OR A61M2230/10 OR A61M2230/14 OR A61M2230/202 OR A61M2230/205 OR A61M2230/60).CPC.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:48
S1357	2	(("7878198") or ("20020185130")).PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:48
S1358	51	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-	US-PGPUB; USPAT	OR	ON	2022/05/19 18:48

		20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-20100258126-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$ or US-7662101-$ or US-7878198-$ or US-8172766-$).did.				
S1359	36	("20020185130" | "20030000528" | "20040138576" | "20040163648" | "20040254493" | "20050081847" | "20050085738" | "20050115561" | "20050165323" | "20050188991" | "20050217674" | "20050268916" | "20060084877" | "20060247546" | "5645043" | "5961447" | "6029664" | "6138675" | "6229581" | "6431171" | "6551252" | "6832609" | "6889691" | "7018341" | "7101341" | "7190995" | "7195013" | "7204250" | "7225809" | "7309314" | "7575005" | "7662101" | "7668579" | "7670295" | "7878198" | "8172766").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:48
S1360	53	S1358 OR S1359	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:48
S1361	2	(("7878198") or ("20020185130")).PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:48
S1362	53	S1358 OR S1359 OR S1361	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:49
S1363	28,827	(A61B5/02055 OR A61B5/085 OR A61B5/4815 OR A61M16/0051 OR A61M16/0069 OR A61M2016/0027 OR A61M2016/0039 OR A61M2202/0208 OR A61M2205/3553 OR A61M2205/3561 OR A61M2205/3584 OR A61M2205/3592 OR A61M2230/04 OR A61M2230/10 OR A61M2230/14	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:49

		OR A61M2230/202 OR A61M2230/205 OR A61M2230/60).CPC.				
S1364	1,018	((sleep$3 NEAR8 (disorder OR illness OR condition OR obstructi$4)) OR apne$3 OR hypoapne$3 OR hyperapne$3 OR hypopne$3) AND ("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) AND ((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3)) AND ((band OR belt OR vest OR strap OR effort) WITH (inducti$4 OR respir$6 OR breath$3 OR chest OR plethysmograph$5)) AND S1363	US-PGPUB; USPAT	OR	ON	2022/05/19 18:49
S1365	39	((sleep$3 NEAR8 (disorder OR illness OR condition OR obstructi$4)) OR apne$3 OR hypoapne$3 OR hyperapne$3 OR hypopne$3) AND ("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) AND ((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3)) AND ((band OR belt OR vest OR strap OR effort) WITH (inducti$4 OR respir$6 OR breath$3 OR chest OR plethysmograph$5)) AND S1362	US-PGPUB; USPAT	OR	ON	2022/05/19 18:49
S1366	39	((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3)) AND ((band OR belt OR vest OR strap OR effort) WITH (inducti$4 OR respir$6 OR breath$3	US-PGPUB; USPAT	OR	ON	2022/05/19 18:49

		OR chest OR plethysmograph$5)) AND S1365				
S1367	39	((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4) WITH (electrode OR sens$5 OR detect$4 OR transducer OR meter$3 OR bioelectrode OR biosens$5 OR biodetect$4 OR biotransducer OR biometer$3 OR measur$5 OR monitor$3)) AND ((band OR belt OR vest OR strap OR effort) WITH (inducti$4 OR respir$6 OR breath$3 OR chest OR plethysmograph$5)) AND S1365	US-PGPUB; USPAT	OR	ON	2022/05/19 18:50
S1368	1	("5704345").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:50
S1369	241	((sleep$3 NEAR8 (disorder OR illness OR condition OR obstructi$4)) OR apne$3 OR hypoapne$3 OR hyperapne$3 OR hypopne$3) AND ("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) AND ((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4 OR ((oxygen OR "O2") ADJ2 saturation)) WITH ((effort OR inductiv$4) WITH (respir$6 OR breath$3 OR chest OR plethysmograph$5))) AND S1363	US-PGPUB; USPAT	OR	ON	2022/05/19 18:50
S1370	241	((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4 OR ((oxygen OR "O2") ADJ2 saturation)) WITH ((effort OR inductiv$4) WITH (respir$6 OR breath$3 OR chest OR plethysmograph$5))) AND S1369	US-PGPUB; USPAT	OR	ON	2022/05/19 18:50
S1371	1	(US-5353788-$).did.	USPAT	OR	ON	2022/05/19 18:50
S1372	0	S1371 AND (fourier)	US-PGPUB; USPAT	OR	ON	2022/05/19 18:51
S1373	287	("4655213" | "4686975" | "4807616" | "4938212" | "4944310" | "4957107" | "5042478" | "5047930" | "5065756" | "5109839" | "5117819" | "5134995" | "5146918" | "5148802").PN. OR ("5353788").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 18:51
S1374	109	S1373 AND (fourier OR "FFT" OR (standard ADJ2 deviat$5) OR ARMAX	US-PGPUB; USPAT	OR	ON	2022/05/19 18:51

		OR (((time ADJ2 frequenc$3) OR wavelet) NEAR3 analy$6))				
S1375	0	S1371 AND (fourier OR "FFT" OR (standard ADJ2 deviat$5) OR ARMAX OR (((time ADJ2 frequenc$3) OR wavelet) NEAR3 analy$6))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:51
S1376	285	("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) AND ((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4 OR ((oxygen OR "O2") ADJ2 saturation)) WITH ((effort OR inductiv$4) WITH (respir$6 OR breath$3 OR chest OR plethysmograph$5))) AND (fourier OR "FFT" OR (standard ADJ2 deviat$5) OR ARMAX OR (((time ADJ2 frequenc$3) OR wavelet) NEAR3 analy$6))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:51
S1377	285	S1376 AND ((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4 OR ((oxygen OR "O2") ADJ2 saturation)) WITH ((effort OR inductiv$4) WITH (respir$6 OR breath$3 OR chest OR plethysmograph$5))) AND (fourier OR "FFT" OR (standard ADJ2 deviat$5) OR ARMAX OR (((time ADJ2 frequenc$3) OR wavelet) NEAR3 analy$6))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:52
S1378	1	(US-5353788-$).did.	USPAT	OR	ON	2022/05/19 18:52
S1379	0	S1378 AND (wireles$3)	US-PGPUB; USPAT	OR	ON	2022/05/19 18:52
S1380	0	S1378 AND (wireles$3 OR radio OR radiofrequenc$3 OR "RF")	US-PGPUB; USPAT	OR	ON	2022/05/19 18:52
S1381	1	("13440116").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:52
S1382	1	("11266899").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:52
S1383	1	S1382 AND bidirection$4	US-PGPUB; USPAT	OR	ON	2022/05/19 18:53
S1384	0	S1378 AND (chemical$4)	US-PGPUB; USPAT	OR	ON	2022/05/19 18:53
S1385	1	S1382 AND quantitative$4	US-PGPUB; USPAT	OR	ON	2022/05/19 18:53
S1386	58	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-	US-PGPUB; USPAT	OR	ON	2022/05/19 18:53

		20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-20100258126-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$ or US-7662101-$ or US-7878198-$ or US-8172766-$ or US-5704345-$ or US-5353788-$ or US-8069852-$ or US-7942824-$ or US-8365730-$).did. or (US-8545416-$ or US-8356594-$).did.				
S1387	5	S1386 AND (short NEAR5 fourier)	US-PGPUB; USPAT	OR	ON	2022/05/19 18:54
S1388	86	("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) AND ((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4 OR ((oxygen OR "O2") ADJ2 saturation)) SAME ((effort OR inductiv$4) WITH (respir$6 OR breath$3 OR chest OR plethysmograph$5))) AND (short NEAR5 fourier)	US-PGPUB; USPAT	OR	ON	2022/05/19 18:54
S1389	86	S1388 AND (short NEAR5 fourier)	US-PGPUB; USPAT	OR	ON	2022/05/19 18:54
S1390	86	S1388 AND (short NEAR5 fourier)	US-PGPUB; USPAT	OR	ON	2022/05/19 18:54
S1391	566	("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) AND ((pulse OR	US-PGPUB; USPAT	OR	ON	2022/05/19 18:54

		oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4 OR ((oxygen OR "O2") ADJ2 saturation)) SAME ((effort OR inductiv$4) WITH (respir$6 OR breath$3 OR chest OR plethysmograph$5))) AND (fourier OR "STFT" OR "FFT" OR (standard ADJ2 deviat$5) OR ARMAX OR (((time ADJ2 frequenc$3) OR wavelet) NEAR3 analy$6))				
S1392	27	("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) AND ((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4 OR ((oxygen OR "O2") ADJ2 saturation)) SAME ((effort OR inductiv$4) WITH (respir$6 OR breath$3 OR chest OR plethysmograph$5)) SAME (fourier OR "STFT" OR "FFT" OR (standard ADJ2 deviat$5) OR ARMAX OR (((time ADJ2 frequenc$3) OR wavelet) NEAR3 analy$6)))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:55
S1393	27	S1392 AND ((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4 OR ((oxygen OR "O2") ADJ2 saturation)) SAME ((effort OR inductiv$4) WITH (respir$6 OR breath$3 OR chest OR plethysmograph$5)) SAME (fourier OR "STFT" OR "FFT" OR (standard ADJ2 deviat$5) OR ARMAX OR (((time ADJ2 frequenc$3) OR wavelet) NEAR3 analy$6)))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:55
S1394	17	S1392 AND ((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4 OR ((oxygen OR "O2") ADJ2 saturation)) SAME ((effort OR inductiv$4) WITH (respir$6 OR breath$3 OR chest OR plethysmograph$5)) SAME (sensor$4 OR transducer)) AND (fourier OR "STFT" OR "FFT" OR (standard ADJ2 deviat$5) OR ARMAX OR (((time ADJ2 frequenc$3) OR wavelet) NEAR3 analy$6))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:55
S1395	247	("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) AND ((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4 OR	US-PGPUB; USPAT	OR	ON	2022/05/19 18:55

		((oxygen OR "O2") ADJ2 saturation)) SAME ((effort OR inductiv$4) WITH (respir$6 OR breath$3 OR chest OR plethysmograph$5)) SAME (sensor$4 OR transducer)) AND (fourier OR "STFT" OR "FFT" OR (standard ADJ2 deviat$5) OR ARMAX OR (((time ADJ2 frequenc$3) OR wavelet) NEAR3 analy$6))				
S1396	247	S1395 AND (fourier OR "STFT" OR "FFT" OR (standard ADJ2 deviat$5) OR ARMAX OR (((time ADJ2 frequenc$3) OR wavelet) NEAR3 analy$6))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:55
S1397	247	("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) AND ((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4 OR ((oxygen OR "O2") ADJ2 saturation)) SAME ((effort OR inductiv$4) WITH (respir$6 OR breath$3 OR chest OR plethysmograph$5)) SAME (sensor$4 OR transducer)) AND (fourier OR "STFT" OR "FFT" OR (standard ADJ2 deviat$5) OR ARMAX OR (((time ADJ2 frequenc$3) OR wavelet) NEAR3 analy$6))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:56
S1398	247	S1397 AND (fourier OR "STFT" OR "FFT" OR (standard ADJ2 deviat$5) OR ARMAX OR (((time ADJ2 frequenc$3) OR wavelet) NEAR3 analy$6))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:56
S1399	784	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (control$4 OR regulat$4 OR set OR setting OR automatic$5)) AND ((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4 OR ((oxygen OR "O2") ADJ2 saturation)) SAME ((effort OR inductiv$4) WITH (respir$6 OR breath$3 OR chest OR plethysmograph$5)))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:56
S1400	147	((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR pulseoxymet$4 OR ((oxygen OR "O2") ADJ2 saturation)) SAME ((effort OR inductiv$4) WITH (respir$6 OR breath$3 OR chest OR plethysmograph$5)) SAME ("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator)	US-PGPUB; USPAT	OR	ON	2022/05/19 18:56

		WITH (control$4 OR regulat$4 OR set OR setting OR automatic$5))				
S1401	58	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-20100258126-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$ or US-7662101-$ or US-7878198-$ or US-8172766-$ or US-5704345-$ or US-5353788-$ or US-8069852-$ or US-7942824-$ or US-8365730-$).did. or (US-8545416-$ or US-8356594-$).did.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:56
S1402	8	(bidirection$5 WITH (communicat$4 OR telemet$4 OR command$4 OR signal$3 OR wireless$4 OR transmi$6 OR receiv$4)) AND S1401	US-PGPUB; USPAT	OR	ON	2022/05/19 18:57
S1403	45	(bidirection$5 WITH (communicat$4 OR telemet$4 OR command$4 OR signal$3 OR wireless$4 OR transmi$6 OR receiv$4)) AND (("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator) WITH (control$4 OR regulat$4 OR set OR setting OR automatic$5)) AND ((pulse OR oximet$4 OR oxymet$4 OR pulseox OR pulseoximet$4 OR	US-PGPUB; USPAT	OR	ON	2022/05/19 18:57

		pulseoxymet$4 OR ((oxygen OR "O2") ADJ2 saturation)) SAME ((effort OR inductiv$4) WITH (respir$6 OR breath$3 OR chest OR plethysmograph$5)))				
S1404	45	(bidirection$5 WITH (communicat$4 OR telemet$4 OR command$4 OR signal$3 OR wireless$4 OR transmi$6 OR receiv$4)) AND S1403	US-PGPUB; USPAT	OR	ON	2022/05/19 18:57
S1406	1	(US-5237990-$).did.	USPAT	OR	ON	2022/05/19 18:57
S1407	0	S1406 AND (wireless$3 OR "RF" OR radio OR radiofrequenc$3)	US-PGPUB; USPAT	OR	ON	2022/05/19 18:58
S1409	24	(((bidirection$5 OR ((two OR "2") ADJ2 way)) WITH (communicat$4 OR telemet$4 OR command$4 OR signal$3 OR transmi$6 OR receiv$4)) SAME (wireless$4 OR "RF" OR radio OR radiofrequenc$3 OR bluetooth) SAME ("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure)))	US-PGPUB; USPAT	OR	ON	2022/05/19 18:58
S1411	197	(((bidirection$5 OR ((two OR "2") ADJ2 way)) WITH (communicat$4 OR telemet$4 OR command$4 OR signal$3 OR transmi$6 OR receiv$4)) SAME (wireless$4 OR "RF" OR radio OR radiofrequenc$3 OR bluetooth)) AND ("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure)) AND ((128/$) OR (600/$)).CCLS.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:59
S1412	16	(((bidirection$5 OR ((two OR "2") ADJ2 way)) SAME (wireless$4 OR "RF" OR radio OR radiofrequenc$3 OR bluetooth)) SAME ("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure))) AND ((128/$) OR (600/$)).CCLS.	US-PGPUB; USPAT	OR	ON	2022/05/19 18:59
S1413	36	("20020185130" | "20030000528" | "20040138576" | "20040163648" | "20040254493" | "20050081847" | "20050085738" | "20050115561" | "20050165323" | "20050188991" | "20050217674" | "20050268916" | "20060084877" | "20060247546" | "5645043" | "5961447" | "6029664" | "6138675" | "6229581" | "6431171" | "6551252" | "6832609" | "6889691" | "7018341" | "7101341" | "7190995" | "7195013" | "7204250" | "7225809" | "7309314" | "7575005" | "7662101" |	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:59

		"7668579" | "7670295" | "7878198" | "8172766").PN.				
S1414	60	S1401 OR S1413	US-PGPUB; USPAT	OR	OFF	2022/05/19 18:59
S1415	11	((bidirection$5 OR ((two OR "2") ADJ2 way)) SAME (wireless$4 OR "RF" OR radio OR radiofrequenc$3 OR bluetooth)) AND S1414	US-PGPUB; USPAT	OR	ON	2022/05/19 18:59
S1416	174	(((bidirection$5 OR ((two OR "2") ADJ2 way)) SAME (wireless$4 OR "RF" OR radio OR radiofrequenc$3 OR bluetooth)) AND ("CPAP" OR (positive ADJ2 airway ADJ2 pressure))) AND ((128/$) OR (600/$)).CCLS.	US-PGPUB; USPAT	OR	ON	2022/05/19 19:00
S1417	174	((bidirection$5 OR ((two OR "2") ADJ2 way)) SAME (wireless$4 OR "RF" OR radio OR radiofrequenc$3 OR bluetooth)) AND S1416	US-PGPUB; USPAT	OR	ON	2022/05/19 19:00
S1418	1	(US-7757690-$).did.	USPAT	OR	ON	2022/05/19 19:00
S1419	1	(US-5353788-$).did.	USPAT	OR	ON	2022/05/19 19:00
S1420	1	(US-5237990-$).did.	USPAT	OR	ON	2022/05/19 19:00
S1421	3	S1418 OR S1419 OR S1420	US-PGPUB; USPAT	OR	OFF	2022/05/19 19:00
S1422	2	S1421 NOT S1401	US-PGPUB; USPAT	OR	OFF	2022/05/19 19:01
S1423	60	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-	US-PGPUB; USPAT	OR	ON	2022/05/19 19:01

		20100258126-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$ or US-7662101-$ or US-7878198-$ or US-8172766-$ or US-5704345-$ or US-5353788-$ or US-8069852-$ or US-7942824-$ or US-8365730-$).did. or (US-8545416-$ or US-8356594-$ or US-5237990-$ or US-7757690-$).did.				
S1424	36	("20020185130" | "20030000528" | "20040138576" | "20040163648" | "20040254493" | "20050081847" | "20050085738" | "20050115561" | "20050165323" | "20050188991" | "20050217674" | "20050268916" | "20060084877" | "20060247546" | "5645043" | "5961447" | "6029664" | "6138675" | "6229581" | "6431171" | "6551252" | "6832609" | "6889691" | "7018341" | "7101341" | "7190995" | "7195013" | "7204250" | "7225809" | "7309314" | "7575005" | "7662101" | "7668579" | "7670295" | "7878198" | "8172766").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 19:01
S1425	28,827	(A61B5/02055 OR A61B5/085 OR A61B5/4815 OR A61M16/0051 OR A61M16/0069 OR A61M2016/0027 OR A61M2016/0039 OR A61M2202/0208 OR A61M2205/3553 OR A61M2205/3561 OR A61M2205/3584 OR A61M2205/3592 OR A61M2230/04 OR A61M2230/10 OR A61M2230/14 OR A61M2230/202 OR A61M2230/205 OR A61M2230/60).CPC.	US-PGPUB; USPAT	OR	OFF	2022/05/19 19:01
S1426	38	("20040138576" | "20050165323" | "6029664" | "7190995" | "7204250" | "7225809" | "7878198" | "5237990" | "20020185130" | "20060084877" | "6229581" | "7101341" | "7668579" | "20040254493" | "20050085738" | "7018341" | "7670295" | "20040163648" | "5961447" | "6431171" | "8172766" | "20050115561" | "6138675" |	US-PGPUB; USPAT	OR	OFF	2022/05/19 19:01

		"20050188991" | "20050217674" | "20050268916" | "20060247546" | "5645043" | "6832609" | "7195013" | "7757690" | "20030000528" | "6551252" | "6889691" | "7575005" | "20050081847" | "7309314" | "7662101").PN.				
S1427	62	S1423 OR S1424 OR S1426	US-PGPUB; USPAT	OR	OFF	2022/05/19 19:01
S1428	7,486	((KAYYALI NEAR2 HANI) OR (SCHMIDT NEAR2 ROBERT) OR ((("MODARRES-ZADEH") OR (MODARRES ADJ2 ZADEH)) NEAR2 MOHAMMAD) OR (KOLKOWSKI NEAR2 BRIAN)).INV.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2022/05/19 19:02
S1429	2	(("11266899") or ("13440116")).PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 19:02
S1430	1	S1429 AND enclosure	US-PGPUB; USPAT	OR	ON	2022/05/19 19:02
S1431	2	S1429 AND blower	US-PGPUB; USPAT	OR	ON	2022/05/19 19:02
S1432	1	("5353788").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 19:03
S1433	60	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-20100258126-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-	US-PGPUB; USPAT	OR	ON	2022/05/19 19:03

		7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$ or US-7662101-$ or US-7878198-$ or US-8172766-$ or US-5704345-$ or US-5353788-$ or US-8069852-$ or US-7942824-$ or US-8365730-$).did. or (US-8545416-$ or US-8356594-$ or US-5237990-$ or US-7757690-$).did.				
S1434	36	("20020185130" | "20030000528" | "20040138576" | "20040163648" | "20040254493" | "20050081847" | "20050085738" | "20050115561" | "20050165323" | "20050188991" | "20050217674" | "20050268916" | "20060084877" | "20060247546" | "5645043" | "5961447" | "6029664" | "6138675" | "6229581" | "6431171" | "6551252" | "6832609" | "6889691" | "7018341" | "7101341" | "7190995" | "7195013" | "7204250" | "7225809" | "7309314" | "7575005" | "7662101" | "7668579" | "7670295" | "7878198" | "8172766").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 19:03
S1435	38	("20040138576" | "20050165323" | "6029664" | "7190995" | "7204250" | "7225809" | "7878198" | "5237990" | "20020185130" | "20060084877" | "6229581" | "7101341" | "7668579" | "20040254493" | "20050085738" | "7018341" | "7670295" | "20040163648" | "5961447" | "6431171" | "8172766" | "20050115561" | "6138675" | "20050188991" | "20050217674" | "20050268916" | "20060247546" | "5645043" | "6832609" | "7195013" | "7757690" | "20030000528" | "6551252" | "6889691" | "7575005" | "20050081847" | "7309314" | "7662101").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 19:03
S1436	62	S1433 OR S1434 OR S1435	US-PGPUB; USPAT	OR	OFF	2022/05/19 19:03
S1437	2	(("20120245447") or ("8920332")).PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 19:04
S1438	7,486	((KAYYALI NEAR2 HANI) OR (SCHMIDT NEAR2 ROBERT) OR ((("MODARRES-ZADEH") OR (MODARRES ADJ2 ZADEH)) NEAR2 MOHAMMAD) OR (KOLKOWSKI NEAR2 BRIAN)).INV.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2022/05/19 19:04

S1439	3	(differentiat$4 WITH central WITH obstructive WITH (apnea OR apneic OR hypoopne$3 OR hypopne$3)).clm. AND S1438	US-PGPUB; USPAT	OR	ON	2022/05/19 19:04
S1440	7,615	((KAYYALI NEAR2 HANI) OR (SCHMIDT NEAR2 ROBERT) OR ((("MODARRES-ZADEH") OR (MODARRES ADJ2 ZADEH)) NEAR2 MOHAMMAD) OR (KOLKOWSKI NEAR2 BRIAN)).INV. OR (cleveland ADJ2 medical).as.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2022/05/19 19:04
S1441	3	(differentiat$4 WITH central WITH obstructive WITH (apnea OR apneic OR hypoopne$3 OR hypopne$3)).clm. AND S1440	US-PGPUB; USPAT	OR	ON	2022/05/19 19:04
S1442	3	(differentiat$4 WITH (apnea OR apneic OR hypoopne$3 OR hypopne$3)).clm. AND S1440	US-PGPUB; USPAT	OR	ON	2022/05/19 19:05
S1443	85,588	(A61B5/02055 OR A61B5/085 OR A61B5/4815 OR A61M16/0051 OR A61M16/0069 OR A61M2016/0027 OR A61M2016/0039 OR A61M2202/0208 OR A61M2205/3553 OR A61M2205/3561 OR A61M2205/3584 OR A61M2205/3592 OR A61M2230/04 OR A61M2230/10 OR A61M2230/14 OR A61M2230/202 OR A61M2230/205 OR A61M2230/60).CPC. OR ((600/484,529-543) OR ("128"/$)).ccls.	US-PGPUB; USPAT	OR	OFF	2022/05/19 19:05
S1444	412	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator)) AND (central WITH (obstructiv$4 OR hypopne$5 OR hypoapne$5) WITH (distinguish$5 OR determin$6 OR differentiat$5)) AND S1443	US-PGPUB; USPAT	OR	ON	2022/05/19 19:05
S1445	412	(central WITH (obstructiv$4 OR hypopne$5 OR hypoapne$5) WITH (distinguish$5 OR determin$6 OR differentiat$5)) AND S1444	US-PGPUB; USPAT	OR	ON	2022/05/19 19:05
S1446	268	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator)) AND (central WITH (obstructiv$4 OR hypopne$5 OR hypoapne$5) WITH (distinguish$5 OR identify$3 OR identification OR differentiat$5)) AND S1443	US-PGPUB; USPAT	OR	ON	2022/05/19 19:05

S1447	268	(central WITH (obstructiv$4 OR hypopne$5 OR hypoapne$5) WITH (distinguish$5 OR identify$3 OR identification OR differentiat$5)) AND S1446	US-PGPUB; USPAT	OR	ON	2022/05/19 19:05
S1448	2	(("11266899") or ("13440116")).PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 19:06
S1449	0	(central WITH (obstructiv$4 OR hypopne$5 OR hypoapne$5) WITH (distinguish$5 OR identify$3 OR identification OR differentiat$5)) AND S1448	US-PGPUB; USPAT	OR	ON	2022/05/19 19:06
S1450	2	(central WITH obstructiv$4 WITH (apne$3 OR hypopne$5 OR hypoapne$5)) AND S1448	US-PGPUB; USPAT	OR	ON	2022/05/19 19:06
S1451	2	(central SAME obstructiv$4 SAME (apne$3 OR hypopne$5 OR hypoapne$5)) AND S1448	US-PGPUB; USPAT	OR	ON	2022/05/19 19:06
S1452	2	((central OR complex OR obstructiv$4) SAME (apne$3 OR hypopne$5 OR hypoapne$5)) AND S1448	US-PGPUB; USPAT	OR	ON	2022/05/19 19:07
S1453	85,588	(A61B5/02055 OR A61B5/085 OR A61B5/4815 OR A61M16/0051 OR A61M16/0069 OR A61M2016/0027 OR A61M2016/0039 OR A61M2202/0208 OR A61M2205/3553 OR A61M2205/3561 OR A61M2205/3584 OR A61M2205/3592 OR A61M2230/04 OR A61M2230/10 OR A61M2230/14 OR A61M2230/202 OR A61M2230/205 OR A61M2230/60).CPC. OR ((600/484,529-543) OR ("128"/$)).ccls.	US-PGPUB; USPAT	OR	OFF	2022/05/19 19:07
S1454	268	(("CPAP" OR "PAP" OR (positive ADJ2 airway ADJ2 pressure) OR ventilat$4 OR respirator)) AND (central WITH (obstructiv$4 OR hypopne$5 OR hypoapne$5) WITH (distinguish$5 OR identify$3 OR identification OR differentiat$5)) AND S1453	US-PGPUB; USPAT	OR	ON	2022/05/19 19:07
S1455	268	(central WITH (obstructiv$4 OR hypopne$5 OR hypoapne$5) WITH (distinguish$5 OR identify$3 OR identification OR differentiat$5)) AND S1454	US-PGPUB; USPAT	OR	ON	2022/05/19 19:07
S1456	2	(("11266899") or ("13440116")).PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 19:07

S1457	2	((central OR complex OR obstructiv$4) SAME (apne$3 OR hypopne$5 OR hypoapne$5)) AND S1456	US-PGPUB; USPAT	OR	ON	2022/05/19 19:07
S1458	2	(atmospher$3) AND S1456	US-PGPUB; USPAT	OR	ON	2022/05/19 19:08
S1459	2	(severity) AND S1456	US-PGPUB; USPAT	OR	ON	2022/05/19 19:08
S1460	2	(carbon) AND S1456	US-PGPUB; USPAT	OR	ON	2022/05/19 19:08
S1461	1	("13440116").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 19:09
S1462	2	("14540623").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 19:09
S1463	2	(side ADJ2 effect ADJ4 dosing) AND S1462	US-PGPUB; USPAT	OR	ON	2022/05/19 19:09
S1464	0	(display$3) AND S1462	US-PGPUB; USPAT	OR	ON	2022/05/19 19:09
S1465	2	(alert$4) AND S1462	US-PGPUB; USPAT	OR	ON	2022/05/19 19:09
S1466	2	(alert$4 OR warn$3 OR alarm$4) AND S1462	US-PGPUB; USPAT	OR	ON	2022/05/19 19:10
S1467	228,798	(A61B5/02055 OR A61B5/085 OR A61B5/4815 OR A61M16/0051 OR A61M16/0069 OR A61M2016/0027 OR A61M2016/0039 OR A61M2202/0208 OR A61M2205/3553 OR A61M2205/3561 OR A61M2205/3584 OR A61M2205/3592 OR A61M2230/04 OR A61M2230/10 OR A61M2230/14 OR A61M2230/202 OR A61M2230/205 OR A61M2230/60).CPC. OR ((600/$) OR ("128"/$)).ccls.	US-PGPUB; USPAT; USOCR	OR	OFF	2022/05/19 19:10
S1468	1,203	(((bidirection$4 OR (two ADJ2 way) OR transceiv$5) WITH (wireless$3 OR communicat$4 OR send$3 OR telemet$4 OR transmiss$4 OR transmit$4 OR send$3 OR receiv$3 OR radio OR radiofrequenc$3 OR "RF")) SAME ((command$3 OR instruct$4 OR control$4) WITH (reconfigur$6 OR configur$6 OR set OR setting OR profile))) AND ((pulseox OR pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR (("O2" OR oxygen) ADJ2 saturat$4)) WITH (sens$5 OR detect$4 OR meter$4 OR probe OR transducer OR monitor$3)) AND S1467	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 19:10

S1469	1,203	(((bidirection$4 OR (two ADJ2 way) OR transceiv$5) WITH (wireless$3 OR communicat$4 OR send$3 OR telemet$4 OR transmiss$4 OR transmit$4 OR send$3 OR receiv$3 OR radio OR radiofrequenc$3 OR "RF")) SAME ((command$3 OR instruct$4 OR control$4) WITH (reconfigur$6 OR configur$6 OR set OR setting OR profile))) AND ((pulseox OR pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR (("O2" OR oxygen) ADJ2 saturat$4)) WITH (sens$5 OR detect$4 OR meter$4 OR probe OR transducer OR monitor$3)) AND S1467	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 19:10
S1470	328	(((bidirection$4 OR (two ADJ2 way) OR transceiv$5) WITH (wireless$3 OR communicat$4 OR send$3 OR telemet$4 OR transmiss$4 OR transmit$4 OR send$3 OR receiv$3 OR radio OR radiofrequenc$3 OR "RF")) SAME ((reconfigur$6 OR configur$6 OR set OR setting OR profile) WITH ((command$3 OR instruct$4 OR control$4) NEAR5 (sens$5 OR detect$4 OR meter$4 OR probe OR transducer OR monitor$3)))) AND ((pulseox OR pulse OR pulsewave$5 OR oximet$4 OR oxymet$4 OR (("O2" OR oxygen) ADJ2 saturat$4))) AND S1467	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 19:10
S1472	2	(US-6533729-$ or US-6475153-$).did.	USPAT	OR	ON	2022/05/19 19:11
S1473	2	(((bidirection$4 OR (two ADJ2 way) OR transceiv$5) SAME (wireless$3 OR communicat$4 OR send$3 OR telemet$4 OR transmiss$4 OR transmit$4 OR send$3 OR receiv$3 OR radio OR radiofrequenc$3 OR "RF")) SAME ((reconfigur$6 OR configur$6 OR set OR setting OR profile) WITH ((command$3 OR instruct$4 OR control$4)))) AND S1472	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 19:11
S1474	228,798	(A61B5/02055 OR A61B5/085 OR A61B5/4815 OR A61M16/0051 OR A61M16/0069 OR A61M2016/0027 OR A61M2016/0039 OR A61M2202/0208 OR A61M2205/3553 OR A61M2205/3561 OR A61M2205/3584 OR A61M2205/3592 OR A61M2230/04 OR A61M2230/10 OR A61M2230/14 OR A61M2230/202 OR A61M2230/205	US-PGPUB; USPAT; USOCR	OR	OFF	2022/05/19 19:11

		OR A61M2230/60).CPC. OR ((600/$) OR ("128"/$)).ccls.				
S1475	228,798	(A61B5/02055 OR A61B5/085 OR A61B5/4815 OR A61M16/0051 OR A61M16/0069 OR A61M2016/0027 OR A61M2016/0039 OR A61M2202/0208 OR A61M2205/3553 OR A61M2205/3561 OR A61M2205/3584 OR A61M2205/3592 OR A61M2230/04 OR A61M2230/10 OR A61M2230/14 OR A61M2230/202 OR A61M2230/205 OR A61M2230/60).CPC. OR ((600/$) OR ("128"/$)).ccls.	US-PGPUB; USPAT; USOCR	OR	OFF	2022/05/19 19:12
S1476	63	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-20100258126-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$ or US-7662101-$ or US-7878198-$ or US-8172766-$ or US-5704345-$ or US-5353788-$ or US-8069852-$ or US-7942824-$ or US-8365730-$).did. or (US-8545416-$ or US-8356594-$ or US-5237990-$ or US-7757690-$ or US-6475153-$ or US-6533729-$ or US-8308641-$).did.	US-PGPUB; USPAT	OR	ON	2022/05/19 19:12

S1477	1	("11130221").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 19:13
S1478	1	("11130221").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2022/05/19 19:13
S1479	1	"11130221".pn.	US-PGPUB; USPAT	OR	ON	2022/05/19 19:13
S1480	4	"11130221"	US-PGPUB; USPAT	OR	ON	2022/05/19 19:13
S1481	1	("7575005").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 19:13
S1482	1	S1481 AND (bidirection$4 OR (two ADJ2 way) OR transceiv$5)	US-PGPUB; USPAT	OR	ON	2022/05/19 19:14
S1483	0	S1481 AND (bidirection$4 OR (two ADJ2 way) OR transceiv$5) AND (radio OR "RF" OR radiofrequenc$3)	US-PGPUB; USPAT	OR	ON	2022/05/19 19:14
S1484	15	S1476 AND (bidirection$4 OR (two ADJ2 way) OR transceiv$5) AND (radio OR "RF" OR radiofrequenc$3)	US-PGPUB; USPAT	OR	ON	2022/05/19 19:14
S1485	1	("7225809").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 19:14
S1486	1	S1485 AND (bidirection$4 OR (two ADJ2 way) OR transceiv$5) AND (radio OR "RF" OR radiofrequenc$3)	US-PGPUB; USPAT	OR	ON	2022/05/19 19:15
S1487	63	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-20100258126-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-	US-PGPUB; USPAT	OR	ON	2022/05/19 19:15

		6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$ or US-7662101-$ or US-7878198-$ or US-8172766-$ or US-5704345-$ or US-5353788-$ or US-8069852-$ or US-7942824-$ or US-8365730-$).did. or (US-8545416-$ or US-8356594-$ or US-5237990-$ or US-7757690-$ or US-6475153-$ or US-6533729-$ or US-8308641-$).did.				
S1488	63	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-20100258126-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$ or US-7662101-$ or US-7878198-$ or US-8172766-$ or US-5704345-$ or US-5353788-$ or US-8069852-$ or US-7942824-$ or US-8365730-$).did. or (US-8545416-$ or US-8356594-$ or US-5237990-$ or US-7757690-$ or US-6475153-$ or US-6533729-$ or US-8308641-$).did.	US-PGPUB; USPAT	OR	ON	2022/05/19 19:15
S1489	17	internet AND S1488	US-PGPUB; USPAT	OR	ON	2022/05/19 19:15

S1490	9	(PDA) AND S1488	US-PGPUB; USPAT	OR	ON	2022/05/19 19:16
S1491	16	(PDA OR cellphone OR cellular OR phone OR telephone) AND S1488	US-PGPUB; USPAT	OR	ON	2022/05/19 19:16
S1492	56	(usage OR operational OR operation) AND S1488	US-PGPUB; USPAT	OR	ON	2022/05/19 19:16
S1493	21	((usage OR operational OR operation) WITH (data OR information OR duration OR interval OR period)) AND S1488	US-PGPUB; USPAT	OR	ON	2022/05/19 19:16
S1494	45	(symptom or severit$3) AND S1488	US-PGPUB; USPAT	OR	ON	2022/05/19 19:17
S1495	1	("7225809").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 19:17
S1496	0	S1495 AND (data WITH sens$5)	US-PGPUB; USPAT	OR	ON	2022/05/19 19:17
S1497	1	("7225809").PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 19:17
S1498	1	S1497 AND (wireless$3 OR transceiver)	US-PGPUB; USPAT	OR	ON	2022/05/19 19:18
S1499	63	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-20100258126-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-	US-PGPUB; USPAT	OR	ON	2022/05/19 19:18

		6832609-$ or US-7662101-$ or US-7878198-$ or US-8172766-$ or US-5704345-$ or US-5353788-$ or US-8069852-$ or US-7942824-$ or US-8365730-$).did. or (US-8545416-$ or US-8356594-$ or US-5237990-$ or US-7757690-$ or US-6475153-$ or US-6533729-$ or US-8308641-$).did.				
S1500	14	bluetooth AND S1499	US-PGPUB; USPAT	OR	ON	2022/05/19 19:18
S1501	15	(("CPAP" OR "PAP" OR (positive$4 ADJ2 airway ADJ2 pressure)) SAME ((chemical$4 OR medicat$4 OR medicine OR agent OR drug) WITH (treat$5 OR therap$4 OR administer$4 OR administrat$4))) AND S1499	US-PGPUB; USPAT	OR	ON	2022/05/19 19:18
S1502	15	(("CPAP" OR "PAP" OR (positive$4 ADJ2 airway ADJ2 pressure)) SAME ((chemical$4 OR medicat$4 OR medicine OR agent OR drug OR pharmaceutical$3) WITH (treat$5 OR therap$4 OR administer$4 OR administrat$4))) AND S1499	US-PGPUB; USPAT	OR	ON	2022/05/19 19:19
S1503	16	(("CPAP" OR "PAP" OR (positive$4 ADJ2 airway ADJ2 pressure)) SAME ((chemical$4 OR medicat$4 OR medicine OR agent OR drug OR pharmaceutical$3) WITH (deliver$4 OR treat$5 OR therap$4 OR administer$4 OR administrat$4))) AND S1499	US-PGPUB; USPAT	OR	ON	2022/05/19 19:19
S1504	1	(US-20020185130-$).did.	US-PGPUB	OR	ON	2022/05/19 19:19
S1505	1	(chemical$4 OR medicat$4 OR medicine OR agent OR drug OR pharmaceutical$3) AND S1504	US-PGPUB; USPAT	OR	ON	2022/05/19 19:19
S1506	228,798	(A61B5/02055 OR A61B5/085 OR A61B5/4815 OR A61M16/0051 OR A61M16/0069 OR A61M2016/0027 OR A61M2016/0039 OR A61M2202/0208 OR A61M2205/3553 OR A61M2205/3561 OR A61M2205/3584 OR A61M2205/3592 OR A61M2230/04 OR A61M2230/10 OR A61M2230/14 OR A61M2230/202 OR A61M2230/205 OR A61M2230/60).CPC. OR ((600/$) OR ("128"/$)).ccls.	US-PGPUB; USPAT; USOCR	OR	OFF	2022/05/19 19:19
S1507	32	(("CPAP" OR "PAP" OR (positive$4 ADJ2 airway ADJ2 pressure)) SAME ((chemical$4 OR medicat$4 OR	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 19:20

		medicine OR agent OR drug OR pharmaceutical$3) WITH (deliver$4 OR treat$5 OR therap$4 OR administer$4 OR administrat$4)) SAME ((adjust$4 OR modification OR modify$3 OR chang$4 OR control$4 OR manag$5) WITH severit$3)) AND S1506				
S1508	163	(("CPAP" OR "PAP" OR (positive$4 ADJ2 airway ADJ2 pressure)) SAME ((chemical$4 OR medicat$4 OR medicine OR agent OR drug OR pharmaceutical$3) WITH (deliver$4 OR treat$5 OR therap$4 OR administer$4 OR administrat$4) WITH (adjust$4 OR modification OR modify$3 OR chang$4 OR manag$5))) AND S1506	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 19:20
S1509	38	("20040138576" | "20050165323" | "6029664" | "7190995" | "7204250" | "7225809" | "7878198" | "5237990" | "20020185130" | "20060084877" | "6229581" | "7101341" | "7668579" | "20040254493" | "20050085738" | "7018341" | "7670295" | "20040163648" | "5961447" | "6431171" | "8172766" | "20050115561" | "6138675" | "20050188991" | "20050217674" | "20050268916" | "20060247546" | "5645043" | "6832609" | "7195013" | "7757690" | "20030000528" | "6551252" | "6889691" | "7575005" | "20050081847" | "7309314" | "7662101").PN.	US-PGPUB; USPAT	OR	ON	2022/05/19 19:20
S1510	27	S1499 NOT S1509	US-PGPUB; USPAT	OR	ON	2022/05/19 19:20
S1511	4	(("20020185130") or ("6533729") or ("7575005") or ("7225809")).PN.	US-PGPUB; USPAT	OR	OFF	2022/05/19 19:21
S1512	6	(brian NEAR2 Kolkowski).INV. AND (navin NEAR2 Natnithithadha)	US-PGPUB; USPAT; USOCR	OR	OFF	2022/05/19 19:21
S1513	63	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$	US-PGPUB; USPAT	OR	ON	2022/05/19 19:21

		or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-20100258126-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$ or US-7662101-$ or US-7878198-$ or US-8172766-$ or US-5704345-$ or US-5353788-$ or US-8069852-$ or US-7942824-$ or US-8365730-$).did. or (US-8545416-$ or US-8356594-$ or US-5237990-$ or US-7757690-$ or US-6475153-$ or US-6533729-$ or US-8308641-$).did.				
S1514	63	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-20100258126-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-	US-PGPUB; USPAT	OR	ON	2022/05/19 19:21

		6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$ or US-7662101-$ or US-7878198-$ or US-8172766-$ or US-5704345-$ or US-5353788-$ or US-8069852-$ or US-7942824-$ or US-8365730-$).did. or (US-8545416-$ or US-8356594-$ or US-5237990-$ or US-7757690-$ or US-6475153-$ or US-6533729-$ or US-8308641-$).did.				
S1515	37	severit$3 AND S1514	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 19:21
S1516	3	(("7942824") or ("8172766") or ("8545416")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2022/05/19 19:22
S1517	2	("46002026").fmid.	US-PGPUB; USPAT; USOCR	OR	OFF	2022/05/19 19:22
S1518	4	S1516 OR S1517	US-PGPUB; USPAT; USOCR	OR	OFF	2022/05/19 19:22
S1519	6	(brian NEAR2 Kolkowski).INV. AND (navin NEAR2 Natnithithadha)	US-PGPUB; USPAT; USOCR	OR	OFF	2022/05/19 19:22
S1520	33,692	(A61B5/085 or A61M16/026 or A61M16/0069 or A61B5/02055 or A61B5/4815 or A61M16/0051 or A61M2205/3553 or A61M2205/3561 or A61M2205/3584 or A61M2205/3592 or A61M2016/0027 or A61M2016/0039 or A61M2202/0208 or A61M2230/04 or A61M2230/10 or A61M2230/14 or A61M2230/202 or A61M2230/205 or A61M2230/60).cpc. OR (600/484,529-543).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2022/05/19 19:22
S1521	6	S1516 OR S1517 OR S1519	US-PGPUB; USPAT; USOCR	OR	OFF	2022/05/19 19:23
S1522	271	("20020032386" | "20020185130" | "20030000528" | "20030135127" | "20040010203" | "20040116784" | "20040138576" | "20040163648" | "20040200474" | "20040210153" | "20040244807" | "20040254493" | "20050005937" | "20050081847" | "20050085738" | "20050115561" |	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 19:23

		"20050165323" | "20050188991" | "20050197588" | "20050217674" | "20050268916" | "20060042627" | "20060070624" | "20060084877" | "20060135878" | "20060241708" | "20060247546" | "20070135724" | "20070161913" | "20070209662" | "20080066753" | "20080257349" | "20080269583" | "20080276939" | "20100043795" | "20100258126" | "5237990" | "5353788" | "5645043" | "5645053" | "5704345" | "5803078" | "5931160" | "5961447" | "6015388" | "6029664" | "6047203" | "6138675" | "6158432" | "6186142" | "6223064" | "6229581" | "6299581" | "6349724" | "6371114" | "6397845" | "6431171" | "6463930" | "6475153" | "6532959" | "6533729" | "6551252" | "6561187" | "6584973" | "6668829" | "6752150" | "6752766" | "6832609" | "6840907" | "6889691" | "6988498" | "7017574" | "7018341" | "7054453" | "7054454" | "7066173" | "7101341" | "7128069" | "7190995" | "7195013" | "7204250" | "7225809" | "7309314" | "7334578" | "7575005" | "7662101" | "7668579" | "7670295" | "7717112" | "7757690" | "7827988" | "7878198" | "7886740" | "7942823" | "7942824" | "8069852" | "8172766" | "8308641" | "8356594" | "8365730" | "8545416" | "9533114").PN. OR ("10076269" | "10543328" | "7942824" | "8172766" | "8545416" | "9533114").URPN.				
S1523	4	(US-20050085738-$ or US-20070161913-$).did. or (US-7878198-$ or US-7757690-$).did.	US-PGPUB; USPAT	OR	ON	2022/05/19 19:23
S1524	1	(US-20070161913-$).did.	US-PGPUB	OR	ON	2022/05/19 19:23
S1525	0	S1524 AND (realtime OR (real ADJ2 time))	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 19:23
S1526	1	S1524 AND (continuous$3)	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 19:24
S1527	1	S1524 AND (ECG OR EKG OR electrocardiograph$5) AND (EEG OR electroencephalograph$5)	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 19:24

S1528	1	S1524 AND (ECG OR EKG OR electrocardiograph$5) AND (EEG OR electroencephalograph$5 OR brain)	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 19:24
S1529	1	S1524 AND (ECG OR EKG OR electrocardiograph$5) AND (EEG OR electroencephalograph$5 OR brain OR brainwave$5)	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 19:25
S1530	1	S1524 AND (wireless$3 OR communicat$4 OR transmit$4 OR transmission)	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 19:25
S1531	0	S1524 AND (nebuliz$4)	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 19:25
S1532	0	S1524 AND (medication)	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 19:25
S1533	1	S1524 AND (medication OR medicine OR drug OR dosage)	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 19:26
S1534	11	(("5704345") or ("6532957") or ("6336454") or ("5794615") or ("5740795") or ("6332463") or ("6237593") or ("5630413") or ("6532959") or ("6152129") or ("6832609")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2022/05/19 19:26
S1535	1	((EEG OR electroencephalograph$5 OR brain) WITH (electrode OR sens$5)) AND S1534	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 19:26
S1536	66	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-20100258126-$).did. or (US-7575005-	US-PGPUB; USPAT	OR	ON	2022/05/19 19:26

		$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$ or US-7662101-$ or US-7878198-$ or US-8172766-$ or US-5704345-$ or US-5353788-$ or US-8069852-$ or US-7942824-$ or US-8365730-$).did. or (US-8545416-$ or US-8356594-$ or US-5237990-$ or US-7757690-$ or US-6475153-$ or US-6533729-$ or US-8308641-$ or US-10543328-$ or US-10076269-$ or US-9533114-$).did.				
S1537	40	((EEG OR electroencephalograph$5 OR brain) WITH (electrode OR sens$5)) AND S1536	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 19:26
S1538	1	(US-7190995-$).did.	USPAT	OR	ON	2022/05/19 19:27
S1539	0	S1538 AND nebuliz$5	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 19:27
S1540	66	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-20100258126-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-	US-PGPUB; USPAT	OR	ON	2022/05/19 19:27

		6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-6832609-$ or US-7662101-$ or US-7878198-$ or US-8172766-$ or US-5704345-$ or US-5353788-$ or US-8069852-$ or US-7942824-$ or US-8365730-$).did. or (US-8545416-$ or US-8356594-$ or US-5237990-$ or US-7757690-$ or US-6475153-$ or US-6533729-$ or US-8308641-$ or US-10543328-$ or US-10076269-$ or US-9533114-$).did.				
S1541	11	S1540 AND (nebuliz$5 SAME (medication OR medicine OR drug OR dosage))	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 19:27
S1542	13	S1522 AND (nebuliz$5 SAME (medication OR medicine OR drug OR dosage))	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 19:27
S1543	2	S1542 NOT S1541	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 19:28
S1544	46	(US-20080276939-$ or US-20080257349-$ or US-20050268916-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20050085738-$ or US-20060042627-$ or US-20070209662-$ or US-20050115561-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$ or US-20020185130-$ or US-20100043795-$ or US-20100258126-$ or US-20040210153-$).did. or (US-7575005-$ or US-7190995-$ or US-6138675-$ or US-6431171-$ or US-7204250-$ or US-7225809-$ or US-7018341-$ or US-6832609-$ or US-7662101-$ or US-7878198-$ or US-8172766-$ or US-5704345-$ or US-5353788-$ or US-8069852-$ or US-7942824-$ or US-8545416-$ or US-8356594-$ or US-7757690-$ or US-10543328-$ or US-10076269-$ or US-9533114-$ or US-5803078-$ or US-6532959-$ or US-6532957-$ or US-6336454-$ or US-6152129-$).did.	US-PGPUB; USPAT	OR	ON	2022/05/19 19:28

S1545	1	(US-20070161913-$).did.	US-PGPUB	OR	ON	2022/05/19 19:28
S1546	1	(internent OR network OR worldwideweb OR web) AND S1545	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 19:28
S1547	1	(internet OR network OR worldwideweb OR web) AND S1545	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 19:29
S1548	0	(bluetooth OR (blue ADJ2 tooth)) AND S1545	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 19:29
S1549	1	(index) AND S1545	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 19:29
S1550	1	(AHI) AND S1545	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 19:29
S1551	1	(remote$4) AND S1545	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 19:30
S1552	77	(US-20080276939-$ or US-20080257349-$ or US-20060247546-$ or US-20050268916-$ or US-20050165323-$ or US-20040254493-$ or US-20040163648-$ or US-20050217674-$ or US-20030000528-$ or US-20050081847-$ or US-20050085738-$ or US-20020032386-$ or US-20030135127-$ or US-20050197588-$ or US-20060042627-$ or US-20060070624-$ or US-20070209662-$ or US-20040200474-$ or US-20050115561-$ or US-20080269583-$ or US-20080066753-$ or US-20070161913-$ or US-20070135724-$ or US-20060135878-$ or US-20060084877-$ or US-20040138576-$).did. or (US-20020185130-$ or US-20040116784-$ or US-20100043795-$ or US-20100258126-$ or US-20040210153-$).did. or (US-7575005-$ or US-7190995-$ or US-6889691-$ or US-6229581-$ or US-6138675-$ or US-6029664-$ or US-5645043-$ or US-6431171-$ or US-7204250-$ or US-6551252-$ or US-7225809-$ or US-7670295-$ or US-5961447-$ or US-7195013-$ or US-7309314-$ or US-7668579-$ or US-7018341-$ or US-	US-PGPUB; USPAT	OR	ON	2022/05/19 19:30

		6832609-$ or US-7662101-$ or US-7878198-$ or US-8172766-$ or US-5704345-$ or US-5353788-$ or US-8069852-$ or US-7942824-$ or US-8365730-$).did. or (US-8545416-$ or US-8356594-$ or US-5237990-$ or US-7757690-$ or US-6475153-$ or US-6533729-$ or US-8308641-$ or US-10543328-$ or US-10076269-$ or US-9533114-$ or US-5803078-$ or US-6532959-$ or US-6532957-$ or US-6336454-$ or US-6332463-$ or US-6237593-$ or US-6152129-$ or US-5794615-$ or US-5740795-$ or US-5630413-$).did.				
S1553	0	((bluetooth OR (blue ADJ2 tooth)) SAME (cellular OR cell OR mobile)) AND S1545	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 19:30
S1554	5	((bluetooth OR (blue ADJ2 tooth)) SAME (cellular OR cell OR mobile)) AND S1552	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 19:30
S1555	17	((bluetooth OR (blue ADJ2 tooth))) AND S1552	US-PGPUB; USPAT; USOCR	OR	ON	2022/05/19 19:31

5/20/2022 5:40:38 AM
H:\EAST\Workspaces\FY2021\16057963.wsp

Doc Code: MFEE.C.AD

Document Description: Maintenance Fee Address Change

PTO/SB/47-EFS

FEE ADDRESS INDICATION FORM

Application Number	16057963	Art Unit	3791
Filing Date	08-Aug-2018	Examiner Name	
First Name Inventor	Hani Kayyali	Attorney Doc. Number	CMD-105

INSTRUCTIONS: In order for the fee address identified on this form to be effective, the issue fee must have been paid for the application listed on this form. Only an address represented by a customer number can be established as the fee address for maintenance fee purposes (hereafter, fee address). A fee address should be established when correspondence related to maintenance fees should be mailed to a different address than the correspondence address for the application. For more information on customer numbers, see the Manual of Patent Examining Procedure (MPEP) § 403.

Please recognize as the Fee Address under the provisions of 37 CFR 1.363 the address associated with:

Customer Number:	81177

Signature :

I certify, in accordance with 37 CFR 1.4(d)(4) that I am an attorney or agent registered to practice before the Patent and Trademark Office who has filed and has been granted power of attorney in this application.

Signature	/Brian Kolkowski/	**Date**	05-26-2022
Name	Brian M. Kolkowski	**Registration Number**	36847

Electronic Patent Application Fee Transmittal

Application Number:	16057963
Filing Date:	08-Aug-2018
Title of Invention:	Devices and Methods for Sleep Disorder Diagnosis and Treatment
First Named Inventor/Applicant Name:	Hani Kayyali
Filer:	Brian M. Kolkowski/Mark Pennington
Attorney Docket Number:	CMD-105

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
UTILITY APPL ISSUE FEE	2501	1	600	600
PUBL. FEE- EARLY, VOLUNTARY, OR NORMAL	1504	1	0	0
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**600**

Electronic Acknowledgement Receipt

EFS ID:	45811687
Application Number:	16057963
International Application Number:	
Confirmation Number:	1595
Title of Invention:	Devices and Methods for Sleep Disorder Diagnosis and Treatment
First Named Inventor/Applicant Name:	Hani Kayyali
Customer Number:	81177
Filer:	Brian M. Kolkowski/Mark Pennington
Filer Authorized By:	Brian M. Kolkowski
Attorney Docket Number:	CMD-105
Receipt Date:	26-MAY-2022
Filing Date:	08-AUG-2018
Time Stamp:	13:47:40
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$600
RAM confirmation Number	E20225PD47364532
Deposit Account	502704
Authorized User	Mark Pennington
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.20 (Post Issuance fees) 37 CFR 1.21 (Miscellaneous fees and charges)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	Web85b.pdf	62758 810c389b9d77f528d33d844fc7c6bcaa99fc474d	no	2
Warnings:					
Information:					
2	Maintenance Fee Address Change	web85feeaddress.pdf	42577 b6f745bf46b077730e3511caa78abdfae8050f83	no	1
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	40624 f86c8f71403fd955dae1a340c37932ff6f12af8c	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	145959		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Document Description: Issue Fee Payment (PTO-85B)

Issue Fee Transmittal Form

Application Number	Filing Date	First Named Inventor	Atty. Docket No.	Confirmation No.
16057963	08-Aug-2018	Hani Kayyali	CMD-105	1595

TITLE OF INVENTION :

Devices and Methods for Sleep Disorder Diagnosis and Treatment

Entity Status	Application Type	Art Unit	Class - Subclass	EXAMINER
Small	Utility under 35 USC 111(a)	3791	544000	

Issue Fee Due	Publication Due	Total Fee(s) Due	Date Due	Prev. Paid Fee
$600	$0	$600	23-Aug-2022	$0

1.Change of Correspondence Address and/or Indication Of Fee Address (37 CFR 1.33 & 1.363)

Current Correspondence Address:	Current Indicated Fee Address :
81177 Cleveland Medical Devices Inc. 4415 Euclid Ave. Ste. 500 Cleveland OH 44103 UNITED STATES 216-649-0376 bkolkowski@clevemed.com	
☐ Change of correspondence address requested, system generated AIA/122-EFS form attached	☒ Fee Address indication requested, system generated SB/47-EFS form attached

2.Entity Status

Change in Entity Status

○ Applicant certifying micro entity status; system generated Micro Entity certification form attached. See 37 CFR 1.29.
Note: Absent a valid certification of micro entity status, issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment. If this box is checked, you will be prompted to choose a micro entity status on the gross income basis (37 CFR 1.29(a)) or the institution of higher education basis (37 CFR 1.29(d)), and make the applicable certification online.

◉ Applicant asserting small entity status. See 37 CFR 1.27.
Note: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

○ Applicant changing to regular undiscounted fee status.
Note: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

Document Description: Issue Fee Payment (PTO-85B)

3.The Following Fee(s) Are Submitted:

☒ Issue Fee

☐ I authorize USPTO to apply my previously paid issue fee to the current fees due

☐ Publication Fee

☐ The Director is hereby authorized to apply my previously paid issue fee to the current fee due and to charge deficient fees to Deposit Account Number _____

☐ Advance Order - # of copies _____

☒ If **in addition to** the payment of the issue fee amount submitted with this form, there are any discrepancies in any amount(s) due, the Director is authorized to charge any deficiency or credit any overpayment, to Deposit Account Number 502704 . The **issue fee must be submitted** with this form. **If payment of the issue fee does not accompany this form, checking this box and providing a deposit account number will NOT be effective to satisfy full payment of the fee(s) due.**

4.Firm and/or Attorney Names To Be Printed

NOTE: If no name is listed, no name will be printed
For printing on the patent front page, list to be displayed as entered

1. Brian Kolkowski
2.
3.

5.Assignee Name(s) and Residence Data To Be Printed

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

Name	City	State	Country	Category
Cleveland Medical Devices Inc.	Cleveland	OHIO	UNITED STATES	corporation

6.Signature

I certify, in accordance with 37 CFR 1.4(d)(4) that I am an attorney or agent registered to practice before the Patent and Trademark Office who has filed and has been granted power of attorney in this application. I also certify that this Fee(s) Transmittal form is being transmitted to the USPTO via EFS-WEB on the date indicated below.

Signature	/Brian Kolkowski/	**Date**	05-26-2022
Name	Brian M. Kolkowski	**Registration Number**	36847

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/057,963	07/05/2022	11375921	CMD-105	1595

81177 7590 06/15/2022

Cleveland Medical Devices Inc.
4415 Euclid Ave. Ste. 500
Cleveland, OH 44103

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 677 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Patents Stakeholder Experience (OPSE), Stakeholder Support Division (SSD) at (571)-272-4200.

INVENTOR(s) (Please see PAIR WEB site http://pair.uspto.gov for additional inventors):

Hani Kayyali, Shaker Heights, OH;
Robert Schmidt, Ft. Myers, FL;
Mohammad Modarres-Zadeh, Tampa, FL;
Brian Kolkowski, Leroy, OH;

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.