

Notice of References Cited

Application/Control No. 17/403,390	Applicant(s)/Patent Under Reexamination Aase, Svein Arne	
Examiner ADAM KOLKIN	Art Unit 3793	Page 1 of 1

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<i>Search Notes</i> 	Application/Control No. 17/403,390	Applicant(s)/Patent Under Reexamination Aase, Svein Arne
	Examiner ADAM KOLKIN	Art Unit 3793

CPC - Searched*		
Symbol	Date	Examiner
A61B8/463, A61B8/4444, A61B8/4483, A61B8/465, A61B8/5207, A61B8/543, G06T7/0014, G06T11/00, A61B8/0891, A61B8/14, G06T2207/10132, G06T2207/20084	12/06/2022	AK


CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* 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
A61B8/463, A61B8/4444, A61B8/4483, A61B8/465, A61B8/5207, A61B8/543, G06T7/0014, G06T11/00, A61B8/0891, A61B8/14, G06T2207/10132, G06T2207/20084	12/06/2022	AK
PE2E Text Search	12/06/2022	AK
PE2E Assignee Search	12/06/2022	AK
PE2E Inventor Search	12/06/2022	AK
Consulted with Primary Examiner Kathy Fernandez of AU 3793	12/06/2022	AK

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<i>Search Notes</i> 	Application/Control No. 17/403,390	Applicant(s)/Patent Under Reexamination Aase, Svein Arne
	Examiner ADAM KOLKIN	Art Unit 3793

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

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[Document Name]Description

[Title of the invention]ULTRASONIC DIAGNOSTIC APPARATUS, CONTROL PROGRAM AND SYSTEM

[Technical field]

[0001]The present invention relates to an ultrasonic diagnostic apparatus which includes a sensor for detecting movement of an ultrasonic probe, and a control program and a system thereof.

[Background of the invention]

[0002]In an ultrasonic diagnostic apparatus, an ultrasonic probe held by a user is applied to a body surface of a subject, and an ultrasonic image based on an echo signal obtained by transmitting and receiving an ultrasonic wave is displayed. An observation site of an ultrasonic image varies depending on a kind of a disease, and depending on an observation site, a user may take an unnatural posture, and a burden on a joint or a muscle may be applied. Further, in a medical examination or the like, a user is very likely to observe a monitor of the same posture and observe a monitor of an ultrasonic diagnostic apparatus for a long time. In this case, there may be a problem in muscles such as neck, shoulder, arm, wrist, etc., joints and the like. This is called a repetitive stress disorder and may be treated as a labor hazard.

[0003]In order to prevent or reduce the burden and / or trouble on the user, it is recommended that the user regularly exercises exercise such as exercise and stretching. The present inventors have earnestly studied to support an exercise for preventing or reducing a burden and a trouble caused in a user's exerciser in an ultrasonic diagnostic apparatus. As described in Patent Document 1, the present inventors have focused on the fact that a position sensor for detecting a position in a space is provided in an ultrasonic probe, and has arrived at the present invention.

[Prior art documents]

[Patent document]

[0004]

[Patent document 1]JP 2014-239731A

[Summary of the invention]

[Problem to be solved by the invention]

[0005]It is an object of the present invention to provide an ultrasonic diagnostic apparatus, a control program and a system thereof, which enable a user to know a degree of achievement when performing the exercise described above.

[Means for solving the problem]

[0006]According to an aspect of the present invention, there is provided an ultrasonic probe for transmitting and receiving an ultrasonic wave to a subject, and a sensor provided on the ultrasonic probe for detecting a movement of the ultrasonic probe. A storage unit storing predetermined criteria relating to movement of the ultrasonic probe associated with the exercise ; The ultrasonic diagnostic apparatus includes an evaluation unit for evaluating the quality of the exercise by performing an evaluation based on the predetermined reference on the basis of the movement of the ultrasonic probe specified based on a detection signal of the sensor, and an informing unit for reporting an evaluation result of the evaluation unit.

[0007]According to another aspect of the present invention, there is provided a system including a server and a computer terminal connected to an ultrasonic diagnostic apparatus according to an aspect of the present invention via a network, wherein the server is provided with a server. The evaluation result of the evaluation unit in the ultrasonic diagnostic apparatus is stored via the network, and the evaluation result stored in the server via the network is input and displayed on the computer terminal.

[Effect of the invention]

[0008]According to the invention of one aspect of the invention, when a user of an ultrasonic diagnostic apparatus carries out an exercise with the ultrasonic probe, a motion of an ultrasonic probe accompanying the exercise is detected by a sensor. Then, the evaluation unit evaluates the detected motion of the ultrasonic probe, and evaluates the quality of the exercise. Then, since the evaluation result is reported, the user can know the achievement degree of the exercise.

[0009]According to another aspect of the present invention, there is provided a server connected to the ultrasonic diagnostic apparatus via the network. The evaluation result of the evaluation unit in the ultrasonic diagnostic apparatus is stored, and the evaluation result of the evaluation unit is displayed on the computer terminal connected to the ultrasonic diagnostic apparatus and the server via the network. Thus, the server and the computer terminal can manage the history of exercise by the user of the ultrasonic diagnostic apparatus.

[Brief description of the drawings]

[0010]

FIG. 1 is a block diagram showing a schematic configuration of an ultrasonic diagnostic apparatus as an example of an embodiment of the present invention ;.

FIG. 2 is a block diagram showing a configuration of a display processing unit ;.

FIG. 3 is a flowchart showing an operation of an ultrasonic diagnostic apparatus according to an embodiment ;.

FIG. 4 is a diagram showing a display unit in which an image prompting an exercise is displayed ;.

FIG. 5 is a diagram showing a display unit in which an image showing an evaluation result is displayed ;.

FIG. 6 is a view showing a display unit in which an image including an image of an

asterisk corresponding to a degree of achievement of a predetermined reference is displayed as an image showing an evaluation result.

FIG. 7 is a block diagram showing a schematic configuration of a system in the 2 embodiment ;.

FIG. 8 is a block diagram showing a schematic configuration of an ultrasonic diagnostic apparatus which is another example of an embodiment of the present invention ;.

FIG. 9 is a block diagram showing a schematic configuration of an ultrasonic diagnostic apparatus which is another example of an embodiment of the present invention ;.

FIG. 10 is a block diagram showing a schematic configuration of an ultrasonic diagnostic apparatus which is another example of an embodiment of the present invention ;.

[Mode for carrying out the invention]

[0011]Hereinafter, embodiments of the present invention will be described with reference to the accompanying drawings.

(First Embodiment)

First, the first embodiment will be described. An ultrasonic diagnostic apparatus 1 shown in FIG. 1 includes an ultrasonic probe 2, a transmission / reception beamformer 3, an echo data processing unit 4, a display processing unit 5, a display unit 6, an operation unit 7, a control unit 8, and a storage unit 9. The ultrasonic diagnostic apparatus 1 has a configuration as a computer.

[0012]The ultrasonic probe 2 includes a plurality of ultrasonic transducers arranged in an array, and transmits ultrasonic waves to the subject by the ultrasonic transducers and receives the echo signals. An ultrasonic probe 2 is an example of an embodiment of an ultrasonic probe according to the present invention.

[0013]The ultrasonic probe 2 is provided with a magnetic sensor 10 composed of, for example, a Hall element. By this magnetic sensor 10, magnetism generated from the magnetism generating unit 11 composed of, for example, a magnetism generating coil is detected. A detection signal in the magnetic sensor 10 is input to the display processing unit 5. The detection signal in the magnetic sensor 10 may be input to the display processing unit 5 via a cable (not shown) or may be input to the display processing unit 5 wirelessly. The magnetic generator 11 and the magnetic sensor 10 are provided to detect the position and inclination of the ultrasonic probe 2 as described later. Further, the magnetic generator 11 and the magnetic sensor 10 are provided for detecting the movement of the ultrasonic probe 2. The movement of the ultrasonic probe 2 is a movement accompanying exercise by a user of the ultrasonic diagnostic apparatus 1, as will be described later. Magnetic sensor 10 is an example of an embodiment of a sensor in the present invention. Further, the magnetic generator 11 is an example of an embodiment of the magnetic generator according to the present invention.

[0014]The transmission / reception beamformer 3 supplies an electric signal for transmitting an ultrasonic wave from the ultrasonic probe 2 under a predetermined scanning condition to the ultrasonic probe 2 based on a control signal from the control unit 8. Further, the transmission / reception beamformer 3 performs signal

processing such as A / D conversion and phasing addition processing on an echo signal received by the ultrasonic probe 2, and outputs echo data after the signal processing to the echo data processing unit 4.

[0015]The echo data processing unit 4 performs B mode processing including, for example, logarithmic compression processing and envelope detection processing on the echo data output from the transmission / reception beamformer 3, and creates B-mode data. However, the echo data processing unit 4 may perform other processing such as Doppler processing.

[0016]As shown in FIG. 2, the display processing unit 5 includes an image display control unit 51, a position calculation unit 52, and an evaluation unit 53. The image display control unit 51 scans and converts raw data obtained by the echo data processing unit 4 by using a scan converter (scan converter), and displays an ultrasonic image based on the ultrasonic image data on the display unit 6. For example, the image display control unit 51 performs scan conversion of the B-mode data by a scan converter to generate B-mode image data, and causes the display unit 6 to display a B-mode image based on the B-mode image data.

[0017]Further, the image display control unit 51 causes the display unit 6 to display an image other than the ultrasonic image. For example, the image display control unit 51 causes the display unit 6 to display an image prompting the user of the ultrasonic diagnostic apparatus 1 to exercise an exercise. Further, as will be described later, the image display control unit 51 causes the display unit 6 to display the evaluation result of the evaluation unit 53. The image display control unit 51 is an example of an embodiment of an image display control unit according to the present invention. The image display control unit 51 is an example of an embodiment of the notification unit in the present invention. Further, the display function of the evaluation result by the image display control unit 51 is an example of an embodiment of the notification function in the present invention.

[0018]Based on the magnetic detection signal from the magnetic sensor 10, the position calculation unit 52 calculates information on the position and inclination of the ultrasonic probe 2 in a coordinate system in a three dimensional space having the magnetic generation unit 11 as an origin (hereinafter, referred to as "probe position information"). Further, the position calculation unit 51 calculates position information in the coordinate system of the echo signal in the 3 dimensional space based on the probe position information. By calculation of the position information, position information in the coordinate system of the ultrasonic probe 2 in the 3 dimensional space of the scanning surface of the ultrasonic wave is identified. Further, the position calculation unit 52 specifies the movement of the ultrasonic probe 2 in the 3 dimensional space based on the time change of the probe position information.

[0019]The evaluation unit 53 evaluates the quality of the exercise by evaluating the movement of the ultrasonic probe 2 specified by the position calculation unit 52 based on a predetermined criterion. The evaluation unit 53 is an example of an embodiment of an evaluation unit according to the present invention.

[0020]The display unit 6 is an LCD (Liquid Crystal Display) or an organic EL (Electro- Luminescence) display. The operation unit 7 includes a keyboard and a pointing device (not shown) for an operator to input instructions and information.

[0021]The control unit 8 is a processor such as a CPU (Central Processing Unit).

The control unit 8 reads out a program stored in the storage unit 9 and controls each unit of the ultrasonic diagnostic apparatus 1. For example, the control unit 8 reads out a program stored in the storage unit 9, and causes the transmission / reception beamformer 3, the echo data processing unit 4, and the display processing unit 5 to execute the functions of the read program.

[0022]The control unit 8 may execute all of the functions of the transmit / receive beamformer 3, all of the functions of the echo data processor 4, and all of the functions of the display processor 5 by a program, or may execute only some of the functions by a program. When the control unit 8 executes only some of the functions, the remaining functions may be executed by hardware such as a circuit.

[0023]Note that the functions of the transmit / receive beamformer 3, the echo data processor 4, and the display processor 5 may be implemented by hardware such as a circuit.

[0024]The storage unit 9 is a semiconductor memory (memory) such as an HDD (Hard Disk Drive : hard disk drive), a RAM (Random Access Memory), and / or a ROM (Read Only Memory). The ultrasonic diagnostic apparatus 1 may include, as the storage unit 9, an HDD, a RAM, and a ROM. Further, the storage unit 9 may be a portable storage medium such as a CD (Compact Disk) or a DVD (Digital Versatile Disk).

[0025]A program executed by the control unit 8 is stored in a non-transitory storage medium such as an HDD or a ROM. Further, the program may be stored in a portable and non-transitory storage medium such as a CD or a DVD.

[0026]Stored in the storage unit 9 is a predetermined criterion for the movement of the ultrasonic probe 2 associated with the exercise. In addition, the evaluation result of the evaluation unit 53 is stored in the storage unit 9. Details will be described later. The storage unit 9 is an example of an embodiment of a storage unit in the present invention.

[0027]In addition, an image for prompting the user of the ultrasonic diagnostic apparatus 1 to exercise an image is stored in the storage unit 9, and a program for causing the image display control unit 51 to display the image is stored as one of the above-described programs.

[0028]Next, an operation of the ultrasonic diagnostic apparatus 1 of this embodiment will be described based on a flowchart of FIG. 3. First, in step S 1, the image display control unit 51 is provided. In accordance with the program described above, an image for prompting the user of the ultrasonic diagnostic apparatus 1, I. e., the user who is performing the ultrasonic wave transmission and reception of ultrasonic waves from the ultrasonic probe 2 to the 3 dimensional space in the three dimensional space, is displayed on the display unit 6 at a predetermined timing. A timing at which an image prompting an exercise is displayed is stored in the storage unit 9. For example, as the timing, a time at which an image prompting exercise is displayed in the storage unit 9 may be stored. Further, as the timing, a timing of a condition related to the degree of fatigue of a user by an inspection using an ultrasonic diagnostic apparatus may be stored in the storage unit 9. Conditions relating to the degree of fatigue of the user by the inspection include the length of time in which the examination is being performed, the distance traveled by the ultrasonic probe 2, the number of the subject examined by the user, and the like. Accordingly, an image prompting an exercise may be displayed at a timing at which the length of time in which an examination is being performed has passed the length of time stored in the

storage unit 9. In addition, an image prompting an exercise may be displayed at a timing at which the moving distance of the ultrasonic probe 2 becomes a moving distance stored in the storage unit 9. The moving distance of the ultrasonic probe 2 is specified based on the position information of the ultrasonic probe 2 calculated by the position calculating unit 52. Alternatively, an image prompting an exercise may be displayed at a timing at which the number of persons examined by the user becomes equal to the number of persons stored in the storage unit 9.

[0029]For example, as shown in FIG. 4, an image I prompting an exercise displayed on the display unit 6 includes a character Ic indicating the content of exercise, an illustration Ii, and a clock Iw. Clock Iw indicates the length of time that exercise is being performed. FIG. 4 shows an image prompting an exercise to swing up and down the wrist.

[0030]Here, exercise is an exercise performed while the ultrasonic probe 2 is held manually, and is an exercise where the ultrasonic probe 2 held by the hand moves. Exercise shall also include stretch.

[0031]Next, in step S 2, the user performs an exercise indicated by image I. The user performs an exercise while holding the ultrasonic probe 2 manually. Here, the user performs an exercise of swinging the wrist up and down while holding the ultrasonic probe 2 manually. When a user performs an exercise, the evaluator 53 evaluates the quality of the exercise. The evaluation unit 53 evaluates the quality of the exercise by evaluating the movement of the ultrasonic probe 2 specified by the position calculation unit 52 based on a predetermined criterion.

[0032]Evaluation based on predetermined criteria includes an evaluation of whether or not the motion of the ultrasonic probe 2 satisfies a predetermined criterion, and an evaluation of a degree of achievement of the motion of the ultrasonic probe 2 relative to a predetermined reference. Also, the quality of exercise is the degree of effect that exercises can be exercised to prevent or reduce the burden and / or trouble on the user's exerciser.

[0033]For example, a predetermined criterion is that a defined motion has been performed for a predetermined amount of time continuously. Here, a predetermined movement is a movement of swinging the wrist up and down. The evaluation unit 53 evaluates whether or not the motion of the ultrasonic probe 2 satisfies the predetermined criterion. If the motion of the ultrasonic probe 2 satisfies a predetermined criterion, the evaluation unit 53 evaluates that the quality of the exercise is good. On the other hand, if the movement of the ultrasonic probe 2 does not satisfy a predetermined criterion, the evaluation unit 53 evaluates that the quality of the exercise is not good.

[0034]In addition, as described above, when a predetermined criterion is used as a predetermined criterion that a predetermined movement is continuously performed for a predetermined period of time, the evaluation unit 53 calculates the predetermined reference value. A degree of achievement for a given criterion is evaluated by identifying a ratio R of a length of time at which a predetermined motion has taken place with respect to a predetermined time defined in the predetermined criterion. The larger the ratio R, the higher the degree of achievement for a given reference and the better the quality of the exercise. Thus, evaluation unit 53 evaluates the degree of exercise quality by evaluating the degree of achievement for a given reference.

[0035]In step S 2, an image I_r representing an evaluation result obtained by the evaluation unit 53 is displayed on the display unit 6 by the image display control unit 51. For example, if the quality of the exercise is evaluated as good, the image display control unit 51 causes the display unit 6 to display a character of "OK" as an image I_r showing an evaluation result, as shown in FIG. 5. If it is estimated that the movement of the ultrasonic probe 2 does not satisfy a predetermined criterion, the image display control unit 51 may display a character indicating that the exercise is insufficient, or may not display anything.

[0036]Further, when the achievement degree for the predetermined reference is evaluated, the image display control unit 51 causes the display unit 6 to display an image corresponding to the achievement level as an image I_r indicating an evaluation result. For example, as shown in FIG. 6, the image display control unit 51 displays an image of an asterisk corresponding to a degree of achievement as an image I_r representing an evaluation result. This star image is an image with a number of stars corresponding to the degree of achievement. As the achievement level increases (as the ratio R increases), the number of stars increases. That is, the greater the number of stars, the better the quality of the exercise.

[0037]Thus, by displaying an image I_r indicating an evaluation result relating to the quality of exercise on the display unit 6, a user can know whether or not a sufficient exercise has been performed, or a degree of achievement of an exercise.

[0038]Next, in step S 3, the evaluation result of the evaluation unit 53 in step S 2 is stored in the storage unit 9. The evaluation result stored in the storage unit 9 is, for example, an exercise that satisfies a predetermined criterion, a degree of achievement for a predetermined criterion, and the like. The evaluation result is stored in the storage unit 9 together with information identifying the user who has performed the exercise.

[0039]The evaluation result stored in the storage unit 9 may be read from the storage unit 9 and displayed on the display unit 6 for each user. Thus, a history of exercise can be known.

[0040]

(2 Embodiment)

Next, a 2 embodiment will be described. Note that description of the same items as in the first embodiment will be omitted.

[0041]The system 100 shown in FIG. 7 includes an ultrasound diagnostic apparatus 1 connected to a network 101. A server 102 and a computer terminal 103 are connected to the network 101. The server 102 and the computer terminal 103 are known servers and computers, and a detailed description thereof will be omitted.

[0042]The ultrasonic diagnostic apparatus 1 is an ultrasonic diagnostic apparatus described in the first embodiment. A plurality of ultrasonic diagnostic apparatuses 1 are connected to the network 101. The evaluation result of the evaluation unit 53 stored in the storage unit 9 of each of the ultrasonic diagnostic apparatuses 1 is stored in the server 102 via the network 101. The evaluation result of the evaluation unit 53 may be stored in the server 102 for each user, for example.

[0043]The evaluation result of the evaluation unit 53 stored in the server 102 is input to the computer terminal 103 via the network 101. For example, when there is an input for requesting the server 102 to evaluate the evaluation result of the

evaluation unit 53 in the computer terminal 103, the evaluation result of the evaluation unit 53 stored in the server 102 is input to the computer terminal 103.

[0044]The evaluation result of the evaluation unit 53 input from the server 102 is displayed on the computer terminal 103. The evaluation result of the evaluation unit 53 may be displayed on the computer terminal 103 for each user.

[0045]Since the evaluation result of the evaluation unit 53 is stored in the server 102 and displayed on the computer terminal 103 in this manner, the history of exercise by the user of the ultrasonic diagnostic apparatus 1 can be managed by the administrator in the server 102 and the computer terminal 103.

[0046]While the present invention has been described with reference to the foregoing embodiments, it is needless to say that the present invention can be variously modified without departing from the spirit and scope of the present invention. For example, when the timing of displaying an image prompting an exercise is reached, and when the image display control unit 51 is in the state of being under examination of an ultrasonic wave in the ultrasonic diagnostic apparatus 1, it may be configured so as not to display an image prompting an exercise.

[0047]Further, the present invention is not limited to the case where an image prompting an exercise is displayed at a preset timing. For example, the image display control unit 51 may display an image prompting an exercise on the display unit 6 based on an input of the operation unit 7 by the user.

[0048]Also, the motion defined in the contents of exercise and predetermined criteria is not limited to the motion of swinging up and down the wrist mentioned in the above embodiment, and may be, for example, a motion of turning the shoulder.

[0049]In addition, the evaluation unit 53 may evaluate the quality of the exercise based on the other elements together with the evaluation based on the predetermined criterion for the movement of the ultrasonic probe 2. Other elements are, for example, electrocardiographic waveforms obtained from a user and data based on echo signals obtained by transmitting and receiving ultrasonic waves by the ultrasonic probe 2 to the user. The data based on the echo signal may be, for example, Doppler data or elastic data indicative of elasticity of a living tissue.

[0050]When the other element is an electrocardiographic waveform, as shown in FIG. 8, the ultrasound diagnostic apparatus 1 includes an electrocardiogram waveform acquisition unit 12. In the electrocardiographic waveform acquisition unit 12, an electrocardiographic waveform acquired from a user is input to an evaluation unit 53 of the display processing unit 5. Here, exercise in which the heartbeat is too high is not preferred. Thus, the evaluation unit 53 identifies the heart rate and evaluates that the quality of the exercise is good if the specified heart rate does not exceed a predetermined threshold and the motion of the ultrasonic probe 2 satisfies a predetermined criterion. On the other hand, when the heart rate exceeds a predetermined threshold value or when the motion of the ultrasonic probe 2 does not satisfy a predetermined criterion, the evaluation unit 53 evaluates that the quality of the exercise is not good. In this case, the image display control unit 51 may cause the display unit 6 to display a message instructing to exercise an exercise such that the heartbeat rate does not increase.

[0051]In addition, when the other elements are Doppler data, the echo data processing unit 4 of the ultrasonic diagnostic apparatus 1 performs Doppler processing on the

echo data output from the transmission / reception beamformer 3 and creates Doppler data. The evaluation unit 53 evaluates the quality of exercise based on the measurement result of the blood flow in the Doppler data. Here, if the rate of blood flow is high, it can be said that there is an exercise effect. Therefore, when the velocity of the blood flow in the Doppler data is equal to or higher than a predetermined value and the motion of the ultrasonic probe 2 satisfies a predetermined criterion, the evaluation unit 53 evaluates that the quality of the exercise is good. On the other hand, when the velocity of the blood flow in the Doppler data is less than the predetermined value or when the motion of the ultrasonic probe 2 does not satisfy the predetermined criterion, the evaluation unit 53 evaluates that the quality of the exercise is not good.

[0052]In addition, when the other element is elastic data, the echo data processing unit 4 of the ultrasonic diagnostic apparatus 1 calculates a measurement value relating to the elasticity of the living tissue such as the strain and the propagation speed of the living tissue by a known method based on the echo data output from the transmit / receive beamformer 3, and creates the elastic data of the measured value. The evaluation unit 53 evaluates the quality of the exercise based on a measurement value relating to elasticity of the living tissue. Here, when the living tissue is softened, it can be said that the muscle is in a loosened state and there is an effect of exercise. Therefore, the evaluation unit 53 evaluates that the quality of the exercise is good when the measurement value related to elasticity is a value indicating that the living tissue is soft according to a predetermined reference (threshold value) and the movement of the ultrasonic probe 2 satisfies a predetermined reference. On the other hand, when the value indicating that the biological tissue is hard according to a predetermined reference (threshold value) or the movement of the ultrasonic probe 2 does not satisfy a predetermined criterion, the evaluation unit 53 evaluates that the quality of the exercise is not good.

[0053]In addition, in order to detect the movement of the ultrasonic probe 2, as shown in FIG. 9, an acceleration sensor 13 may be provided in the ultrasonic probe 2 instead of the magnetic sensor 10. In this case, the acceleration sensor 13 is an example of an embodiment of a sensor according to the present invention.

[0054]As shown in FIG. 10, the evaluation result of the evaluation unit 53 may be output as a sound from the speaker 14 of the ultrasonic diagnostic apparatus 1. A control part 8 outputs an evaluation result of an evaluation part 53 from a speaker 14 as sound. The control unit 8 is an example of an embodiment of a notification unit according to the present invention. Further, a function of causing the control unit 8 to output the evaluation result is an example of an embodiment of the notification function of the present invention.

[Explanation of letters or numerals]

[0055]

1. Ultrasonic Diagnostic Equipment
- 2 ultrasonic probe
6. Display Part
- 8 Control Part
9. Storage Part
- 10 Magnetic Sensor
13. acceleration sensor
- 51 image display control unit
53. Evaluating Part

100 System 101 Network 102 Server 103 Computer Terminal

Doc code: IDS
 Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (02-18)
 Approved for use through 11/30/2020. OMB 0651-0031
 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	17403390
	Filing Date	2021-08-16
	First Named Inventor	Aase, Svein Arne
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	Attorney Docket Number	325299-US-3

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	First Named Inventor	Aase, Svein Arne	
	Art Unit		
	Examiner Name		
	Attorney Docket Number		325299-US-3

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Jacob Groethe/	Date (YYYY-MM-DD)	2021-11-05
Name/Print	Jacob Groethe	Registration Number	45,694

This collection of information is required by 37 CFR 1.97 and 1.98. 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 1 hour 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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PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	255440	general.as.	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO, JP, EP, KR); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/02 07:12 PM
L2	1179	aase.in.	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO, JP, EP, KR); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/02 07:12 PM
L3	8	(1 OR 2) AND (designat\$3 near3 view) AND (progress near3 complet\$5)	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO, JP, EP, KR); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/02 07:14 PM
L4	2	"20170262982".pn.	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO, JP, EP, KR); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/02 07:36 PM
L5	2	"20180161010".pn.	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO, JP, EP, KR); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/02 07:37 PM
L6	15	"1872001".pn.	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO, JP, EP, KR); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/02 07:38 PM
L7	2	"20080249407".pn.	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO, JP, EP, KR); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/02 07:41 PM
L8	4	"20160030008".pn.	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO, JP, EP, KR); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/02 07:42 PM
L9	2	"8869259".pn.	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO, JP, EP, KR); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/02 07:42 PM
L10	2	"20170273663".pn.	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO, JP, EP, KR); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/02 07:43 PM

L11	39925	A61B8* AND ((determin\$5 OR accept\$3 OR reject\$3 OR discard\$3 OR stor\$3) WITH (condition\$3 OR parameter OR (heartrate OR (heart ADJ rate)) OR ((breath\$3 OR respirat\$3) near3 rate)))	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO, JP, EP, KR); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/16 01:50 PM
L12	41171	A61B8* AND ((determin\$5 OR accept\$3 OR reject\$3 OR discard\$3 OR stor\$3) WITH (condition\$3 OR parameter OR (heartrate OR (heart ADJ rate)) OR ((breath\$3 OR respirat\$3) near3 rate) OR (framerate OR frame ADJ rate) OR (line near3 density)))	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO, JP, EP, KR); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/16 01:52 PM
L13	18096	A61B8* AND ((determin\$5 OR accept\$3 OR reject\$3 OR discard\$3 OR stor\$3) WITH (imag\$3 OR view) WITH (condition\$3 OR parameter OR (heartrate OR (heart ADJ rate)) OR ((breath\$3 OR respirat\$3) near3 rate) OR (framerate OR frame ADJ rate) OR (line near3 density)))	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO, JP, EP, KR); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/16 01:54 PM
L14	8484	A61B8* AND ((accept\$3 OR reject\$3 OR discard\$3 OR stor\$3) WITH (imag\$3 OR view) WITH (condition\$3 OR parameter OR (heartrate OR (heart ADJ rate)) OR ((breath\$3 OR respirat\$3) near3 rate) OR (framerate OR frame ADJ rate) OR (line near3 density)))	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO, JP, EP, KR); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/16 01:55 PM
L15	331	A61B8* AND ((accept\$3 OR reject\$3 OR discard\$3 OR	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO, JP, EP, KR);	OR	ON	ON	2022/11/16 01:59 PM

L16	35	stor\$3) WITH (imag\$3 OR view) WITH (condition\$3 OR parameter OR (heartrate OR (heart ADJ rate)) OR ((breath\$3 OR respirat\$3) near3 rate) OR (framerate OR frame ADJ rate) OR (line near3 density)) WITH (fulfill\$3 OR acceptable OR satisf* OR met OR meet\$3))	FPRS; EPO; JPO; DERWENT; IBM_TDB)				
		A61B8* AND ((accept\$3 OR reject\$3 OR discard\$3) WITH (imag\$3 OR view) WITH (condition\$3 OR parameter OR (heartrate OR (heart ADJ rate)) OR ((breath\$3 OR respirat\$3) near3 rate) OR (framerate OR frame ADJ rate) OR (line near3 density)) WITH (fulfill\$3 OR acceptable OR satisf* OR met OR meet\$3))	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO, JP, EP, KR); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/16 02:11 PM
L17	63	A61B8* AND ((accept\$3 OR approv\$3 OR delet\$3 OR reject\$3 OR discard\$3) WITH (imag\$3 OR frame OR view) WITH (condition\$3 OR parameter OR (heartrate OR (heart ADJ rate)) OR ((breath\$3 OR respirat\$3) near3 rate) OR (framerate OR frame ADJ rate) OR (line near3 density)) WITH (fulfill\$3 OR acceptable OR satisf* OR met OR meet\$3))	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO, JP, EP, KR); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/16 02:28 PM
L18	96	A61B8* AND ((accept\$3 OR approv\$3 OR delet\$3 OR reject\$3 OR discard\$3) WITH (imag\$3 OR frame OR view) WITH (condition\$3 OR	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO, JP, EP, KR); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/16 02:28 PM

L19	98	parameter OR (heartrate OR (heart ADJ rate)) OR ((breath\$3 OR respirat\$3) near3 rate) OR (framerate OR frame ADJ rate) OR (line near3 density)) WITH (fulfill\$3 OR acceptable OR satisf* OR met OR meet\$3 OR threshold))	(US-PGPUB; USPAT; USOCR; FIT (CN, EP, FR, JP, KR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/16 08:25 PM
L20	719	A61B8* AND ((accept\$3 OR approv\$3 OR delet\$3 OR reject\$3 OR discard\$3 OR omi*) WITH (imag\$3 OR frame OR view) WITH (condition\$3 OR parameter OR event OR threshold OR predetermined OR (pre ADJ determined) OR prerequisite OR (pre ADJ requisite) OR (heartrate OR (heart ADJ rate)) OR ((breath\$3 OR respirat\$3) near3 rate) OR (framerate OR frame ADJ rate) OR (line near3 density)) WITH (fulfill\$3 OR acceptable OR satisf* OR met OR meet\$3))	(US-PGPUB; USPAT; USOCR; FIT (CN, EP, FR, JP, KR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/16 08:52 PM

L21	407	<p>WITH (fulfill\$3 OR acceptable OR satisf* OR met OR meet\$3 OR above OR below OR higher OR lower OR greater OR less\$2 OR within OR outside))</p> <p>A61B8* AND (((accept\$3 OR approv\$3 OR delet\$3 OR reject\$3 OR discard\$3 OR omi*) near6 (imag\$3 OR frame OR view)) WITH (condition\$3 OR parameter OR event OR threshold OR predetermined OR (pre ADJ determined) OR prerequisite OR (pre ADJ requisite) OR (heartrate OR (heart ADJ rate)) OR ((breath\$3 OR respirat\$3) near3 rate) OR (framerate OR frame ADJ rate) OR (line near3 density)) WITH (fulfill\$3 OR acceptable OR satisf* OR met OR meet\$3 OR above OR below OR higher OR lower OR greater OR less\$2 OR within OR outside))</p>	(US-PGPUB; USPAT; USOCR; FIT (CN, EP, FR, JP, KR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/16 09:04 PM
L22	311	<p>A61B8* AND (((accept\$3 OR approv\$3 OR delet\$3 OR reject\$3 OR discard\$3 OR omi*) near6 (imag\$3 OR frame OR view)) WITH ((condition\$3 OR parameter OR event OR threshold OR predetermined OR (pre ADJ determined) OR prerequisite OR (pre ADJ requisite) OR (heartrate OR (heart ADJ rate)) OR ((breath\$3 OR respirat\$3) near3 rate) OR (framerate OR frame ADJ rate) OR (line near3 density)) near6 (fulfill\$3 OR</p>	(US-PGPUB; USPAT; USOCR; FIT (CN, EP, FR, JP, KR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/16 09:07 PM

L23	8803	acceptable OR satisf* OR met OR meet\$3 OR above OR below OR higher OR lower OR greater OR less\$2 OR within OR outside))) A61B8* AND ((accept\$3 OR approv\$3 OR delet\$3 OR reject\$3 OR discard\$3 OR omi*) near6 (imag\$3 OR frame OR view))	(US-PGPUB; USPAT; USOCR; FIT (CN, EP, FR, JP, KR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/17 03:52 PM
L24	6190	23 AND ((condition\$3 OR parameter OR event OR standard OR metric OR threshold OR predetermined OR (pre ADJ determined) OR prerequisite OR (pre ADJ requisite) OR (heartrate OR (heart ADJ rate)) OR ((breath\$3 OR respirat\$3) near3 rate) OR (framerate OR frame ADJ rate) OR (line near3 density)) near6 (chang\$3 OR alter\$5 OR adjust\$4 OR modif\$7 OR different OR other OR another OR second))	(US-PGPUB; USPAT; USOCR; FIT (CN, EP, FR, JP, KR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/17 03:54 PM
L25	823	A61B8* AND (((accept\$3 OR approv\$3 OR delet\$3 OR reject\$3 OR discard\$3 OR omi*) near6 (imag\$3 OR frame OR view)) SAME ((condition\$3 OR parameter OR event OR standard OR metric OR threshold OR predetermined OR (pre ADJ determined) OR prerequisite OR (pre ADJ requisite) OR (heartrate OR (heart ADJ rate)) OR ((breath\$3 OR respirat\$3) near3 rate) OR (framerate OR frame ADJ rate) OR (line near3 density)) near6 (chang\$3 OR alter\$5 OR adjust\$4 OR	(US-PGPUB; USPAT; USOCR; FIT (CN, EP, FR, JP, KR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/17 03:55 PM

L26	341	<p>modif\$7 OR different OR other OR another OR second)))</p> <p>A61B8* AND (((accept\$3 OR approv\$3 OR delet\$3 OR reject\$3 OR discard\$3 OR omi*) near6 (imag\$3 OR frame OR view)) WITH ((condition\$3 OR parameter OR event OR standard OR metric OR threshold OR predetermined OR (pre ADJ determined) OR prerequisite OR (pre ADJ requisite) OR (heartrate OR (heart ADJ rate)) OR ((breath\$3 OR respirat\$3) near3 rate) OR (framerate OR frame ADJ rate) OR (line near3 density)) near6 (chang\$3 OR alter\$5 OR adjust\$4 OR modif\$7 OR different OR other OR another OR second)))</p>	(US-PGPUB; USPAT; USOCR; FIT (CN, EP, FR, JP, KR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/17 03:57 PM
L27	338	<p>A61B8* AND (((accept\$3 OR approv\$3 OR delet\$3 OR reject\$3 OR discard\$3 OR omi*) near6 (imag\$3 OR frame OR view)) WITH ((condition\$3 OR parameter OR event OR standard OR metric OR threshold OR predetermined OR (pre ADJ determined) OR prerequisite OR (pre ADJ requisite) OR (framerate OR frame ADJ rate) OR (line near3 density)) near6 (chang\$3 OR alter\$5 OR adjust\$4 OR modif\$7 OR different OR other OR another OR second)))</p>	(US-PGPUB; USPAT; USOCR; FIT (CN, EP, FR, JP, KR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/17 03:57 PM
L28	238	<p>A61B8* AND (((delet\$3 OR reject\$3 OR discard\$3 OR omi*) near6 (imag\$3 OR</p>	(US-PGPUB; USPAT; USOCR; FIT (CN, EP, FR, JP, KR, WO); FPRS; EPO; JPO;	OR	ON	ON	2022/11/17 04:24 PM

L29	51	frame OR view)) WITH ((condition\$3 OR parameter OR event OR standard OR metric OR threshold OR predetermined OR (pre ADJ determined) OR prerequisite OR (pre ADJ requisite) OR (framerate OR frame ADJ rate) OR (line near3 density)) near6 (chang\$3 OR alter\$5 OR adjust\$4 OR modif\$7 OR different OR other OR another OR second)))	DERWENT; IBM_TDB)				
		A61B8* AND (((accept\$3 OR approv\$3 OR delet\$3 OR reject\$3 OR discard\$3 OR omi*) near6 (imag\$3 OR frame OR view)) SAME ((physiolog* OR heart* OR cardi* OR breath\$3 OR respirat\$3) near6 (chang\$3 OR alter\$5 OR rais\$3 OR lower OR higher OR greater OR less\$2 OR increas\$3 OR decreas\$3 OR hold\$3 OR held)))	(US-PGPUB; USPAT; USOCR; FIT (CN, EP, FR, JP, KR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/17 07:43 PM
L30	94395	A61B8* AND ((accept\$3 OR approv\$3 OR delet\$3 OR reject\$3 OR discard\$3 OR omi* OR stor\$3 OR sav\$3 OR captur\$3 OR record\$3 OR obtain\$3) near6 (imag\$3 OR frame OR view))	(US-PGPUB; USPAT; USOCR; FIT (CN, EP, FR, JP, KR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/17 08:27 PM
L31	544	30 AND ((instruct\$5 OR advis\$3 OR guid\$4) WITH ((physiolog* OR heart* OR cardi* OR breath\$3 OR respirat\$3) near6 (chang\$3 OR alter\$5 OR rais\$3 OR lower OR higher OR greater OR less\$2 OR increas\$3 OR decreas\$3 OR hold\$3 OR held)))	(US-PGPUB; USPAT; USOCR; FIT (CN, EP, FR, JP, KR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/17 08:30 PM
L32	117	30 AND (((instruct\$5 OR advis\$3 OR guid\$4)	(US-PGPUB; USPAT; USOCR; FIT (CN, EP,	OR	ON	ON	2022/11/17 08:33 PM

		near6 (patient OR subject OR person)) WITH ((physiolog* OR heart* OR cardi* OR breath\$3 OR respirat\$3) near6 (chang\$3 OR alter\$5 OR rais\$3 OR lower OR higher OR greater OR less\$2 OR increas\$3 OR decreas\$3 OR hold\$3 OR held)))	FR, JP, KR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L33	3256	A61B8* AND (view WITH (chang\$3 OR adjust\$4 OR alter\$5 OR modif\$7 OR other OR another OR different) WITH (condition OR parameter OR standard OR metric))	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO, JP, EP, KR); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/19 08:51 PM
L34	1876	33 AND (imag\$3 near3 (protocol OR sequence OR series OR list OR order))	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO, JP, EP, KR); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/19 08:53 PM
L35	1711	A61B8* AND (view WITH ((chang\$3 OR adjust\$4 OR alter\$5 OR modif\$7 OR other OR another OR different) near6 (condition OR parameter OR metric)))	(US-PGPUB; USPAT; USOCR; FIT (CN, EP, FR, JP, KR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/19 08:56 PM
L36	1070	35 AND (imag\$3 near3 (protocol OR sequence OR series OR list OR order))	(US-PGPUB; USPAT; USOCR; FIT (CN, EP, FR, JP, KR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/19 08:56 PM
L37	471	A61B8* AND (view WITH ((chang\$3 OR adjust\$4 OR alter\$5 OR modif\$7 OR other OR another OR different) near3 (condition OR parameter OR metric) near3 (imag\$3 OR ultraso\$3 OR scan\$4 OR predetermined OR (pre ADJ determined))))	(US-PGPUB; USPAT; USOCR; FIT (CN, EP, FR, JP, KR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/19 09:11 PM
L38	338	37 AND (imag\$3 near3 (protocol OR sequence OR series OR list OR order))	(US-PGPUB; USPAT; USOCR; FIT (CN, EP, FR, JP, KR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/19 09:12 PM
L39	614	A61B8* AND ((warn\$3 OR notif\$7 OR alert\$3 OR alarm\$3) WITH	(US-PGPUB; USPAT; USOCR; FIT (CN, EP, FR, JP, KR, WO);	OR	ON	ON	2022/11/21 02:21 PM

L40	305	(imag\$3 OR view OR session OR protocol OR procedure OR scan\$3) WITH (terminat\$3 OR cancel\$4 OR end\$3 OR interrupt\$3 OR exit\$4)) A61B8* AND ((warn\$3 OR notif\$7 OR alert\$3 OR alarm\$3) WITH (imag\$3 OR view OR session OR protocol OR procedure OR scan\$3) WITH (terminat\$3 OR cancel\$4 OR interrupt\$3 OR exit\$4))	FPRS; EPO; JPO; DERWENT; IBM_TDB) (US-PGPUB; USPAT; USOCR; FIT (CN, EP, FR, JP, KR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/21 02:22 PM
L41	8	A61B8* AND ((warn\$3 OR notif\$7 OR alert\$3 OR alarm\$3) WITH (imag\$3 OR view OR session OR protocol OR procedure OR scan\$3) WITH (terminat\$3 OR cancel\$4 OR interrupt\$3 OR exit\$4) WITH ((prior OR before) near3 (complet\$3 OR finish\$3 OR end\$3 OR done)))	(US-PGPUB; USPAT; USOCR; FIT (CN, EP, FR, JP, KR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/21 02:34 PM
L42	38	A61B* AND ((warn\$3 OR notif\$7 OR alert\$3 OR alarm\$3) WITH (imag\$3 OR view OR session OR protocol OR procedure OR scan\$3) WITH (terminat\$3 OR cancel\$4 OR interrupt\$3 OR exit\$4) WITH ((prior OR before) near3 (complet\$3 OR finish\$3 OR end\$3 OR done)))	(US-PGPUB; USPAT; USOCR; FIT (CN, EP, FR, JP, KR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/21 02:35 PM
L43	75	A61B* AND ((warn\$3 OR notif\$7 OR alert\$3 OR alarm\$3) WITH (terminat\$3 OR cancel\$4 OR interrupt\$3 OR exit\$4) WITH ((prior OR before) near3 (complet\$3 OR finish\$3 OR end\$3 OR done)))	(US-PGPUB; USPAT; USOCR; FIT (CN, EP, FR, JP, KR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/11/21 03:17 PM
L44	103	A61B* AND ((warn\$3	(US-PGPUB; USPAT;	OR	ON	ON	2022/11/21

L45	783	OR notif\$7 OR alert\$3 OR alarm\$3) WITH3 ((terminat\$3 OR cancel\$4 OR interrupt\$3 OR exit\$4) WITH ((prior OR before) near3 (complet\$3 OR finish\$3 OR end\$3 OR done)))) ((ultrasound OR ultrasonic) WITH imag\$3) AND (((physiological OR heart OR breath\$ OR lung OR respiration) WITH (standard OR limit OR threshold OR range)) SAME ((instruct\$3 OR guid\$4 OR message OR notification OR feedback) WITH (exercise OR treadmill OR movement OR motion OR increas\$3 OR decreas\$3 OR hold\$3)))	USOCR; FIT (CN, EP, FR, JP, KR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB) (US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO, JP, EP, KR); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	03:25 PM 2022/12/02 02:22 PM
L46	14	((ultrasound OR ultrasonic) WITH imag\$3) AND (((heart ADJ (beat OR rate)) OR breath\$3 OR respiration)) SAME (threshold OR standard OR limit) SAME (((increas\$3 OR decreas\$) WITH (exercis\$3 OR treadmill)))) SAME (guid\$4 OR instruct\$3))	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO, JP, EP, KR); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/12/02 02:22 PM

PE2E SEARCH - Search History (Interference)

There are no Interference searches to show.