Appeal decision

Appeal No. 2019-12254

Appellant	Tata Consultancy Services Limited
Patent Attorney	HAYASHI, Kazuyoshi
Patent Attorney	SHIBA, Tetsuo
Patent Attorney	SAITO, Takuya
Patent Attorney	IWAIKE, Mitsuru
Patent Attorney	KOSUGE, Kazuhiro

The case of appeal against the examiner's decision of refusal of Japanese Patent Application No. 2017-22867, entitled "SYSTEM AND METHOD FOR ANALYZING GAIT AND POSTURAL BALANCE OF A PERSON" (the application published on August 17, 2017, Japanese Unexamined Patent Application Publication No. 2017-140393), has resulted in the following appeal decision.

Conclusion

The appeal of the case was groundless.

Reason

No. 1 History of the procedures

The application was filed on February 10, 2017 (priority claim under the Paris Convention: February 12, 2016, India), a notice of reasons for refusal was issued on March 22, 2018, a written opinion and a written amendment were submitted on August 13, 2018, a notice of reasons for refusal was further issued on September 21, 2018, a written opinion and a written amendment were submitted on February 22, 2019, a decision to dismiss the amendment as of February 22 was made on April 24, 2019, and the examiner's decision of refusal (hereinafter, referred to as "Examiner's decision") was issued on the same day. Against this, a demand for appeal against the examiner's decision of refusal was made on September 17, 2019, and, at the same time, a written amendment (hereinafter, referred to as "the Amendment") was submitted.

No. 2 Decision to dismiss amendment on the written amendment

[Conclusion of Decision to Dismiss Amendment]

The Amendment shall be dismissed.

[Reason]

1 Regarding the Amendment

The Amendment is an amendment regarding the scope of claims, and includes the following amendments with respect to Claim 1.

(1) Description of Claim 1 before the Amendment

"[Claim 1]

A method for analyzing postural balance of a person, the method comprising a processor implemented steps of:

capturing skeleton data of the person using a 3D motion sensor;

removing a plurality of noises from the captured skeleton data using a noise cleaning module;

tracking ankle coordinates of the person from the captured skeleton data in x plane and y plane;

estimating the postural balance of the person on the basis of a plurality of gait parameters derived from the tracked ankle coordinates of the person; and

measuring a static single limb stance (static single limb stance (SLS)) duration of the person, wherein the SLS duration is indicative of the postural balance of the person".

(2) Description of Claim 1 after the Amendment

The description of Claim 1 after the Amendment is as follows.

"[Claim 1]

A method for analyzing postural balance of a person, the method comprising a processor implementing steps of:

capturing skeleton data of the person using a 3D motion sensor;

removing a plurality of noises from the captured skeleton data using a noise cleaning module, <u>wherein the plurality of noises include one or more errors, and the plurality of noises are removed by the following steps (a) to (c),</u>

<u>(a) converting the captured skeleton data into a set of features related to a physical structure of the person,</u>

<u>(b) computing static features of the physical structure in each frame, and</u>

(c) tracking changes in the static features on the basis of front and rear frames;

tracking ankle coordinates of the person from the captured skeleton data in x plane and y plane;

calculating a plurality of gait parameters of the person using the tracked ankle coordinates of the person by the following steps (d) to (h);

(d) obtaining a velocity profile of a corresponding ankle, and

(e) computing curvature points that are two points indicating the beginning of two continuous stance phases of a specific leg, on the basis of the velocity profile,

(f) detecting a peak region and a trough region from the velocity profile to obtain a set of data points of the peak region and the trough region,

(g) computing a covariance matrix of normalized data obtained by calculating mean and standard deviation of the set of the data points, and

(h) computing the eigenvalue decomposition of the covariance matrix to perform an eigenvector based curvature analysis and obtain a curvature point indicating the beginning of a swing phase with respect to the leg, wherein an eigenvector corresponding to a minimum eigenvalue provides a direction of a minimum fluctuation of the set of the data points and clarifies a direction toward the curvature point of the beginning of the swing phase, and the curvature point of the beginning of the swing phase, the curvature points of the beginning of the two continuous curvature points, and the set of the data points detected in the peak region and the trough region of the velocity profile are used for calculating the plurality of gait parameters; and

measuring a static single limb stance (SLS) duration of the person by the following steps (i) to (j),

(i) obtaining changes in the tracked ankle coordinates of the person, and

(j) executing the eigenvector based curvature analysis with respect to the obtained changes in the tracked ankle coordinates to determine two negative curvature points, wherein a duration between the determined negative curvature points is a static SLS duration". (Underlines indicate amended portions.)

2 Propriety of amendment

(1) Purpose of the Amendment

The Amendment eliminated the matter of "estimating the postural balance of the person on the basis of a plurality of gait parameters" and the matter that "the SLS duration is indicative of the postural balance of the person" of Claim 1 before the Amendment. Eliminating these matters specifying the invention is not for the purpose of any of the items of Article 17-2(5) of the Patent Act.

Further, since the former, as mentioned No. 3-3 (1) below, falls under the addition of new matter, although it may be disregarded in some cases, eliminating the latter that "the SLS duration is indicative of the postural balance of the person" makes the SLS duration expand to one that is not indicative of a postural balance of a person, does not fall under the restriction of the scope of claims in accordance with Article 17-2(5)(ii), and does not fall under any of the deletion of a claim or claims in Article 17-2(5)(i) of the Patent Act, the correction of errors in Article 17-2(5)(iii) of the Patent Act, and the clarification of an ambiguous description in Article 17-2(5)(iv) of the Patent Act.

Therefore, the Amendment violates the requirement stipulated in Article 17-2(5) of the Patent Act.

(2) Judgment on independent requirements for patentability

Although the Appellant merely explained about the Amendment that "the ground of the Amendment is descriptions in Paragraphs [0022] to [0044] of the specification" in the written request for appeal and does not clarify its purpose, since except for the points pointed out in (1) above, it can be said each of "a step of removing noise," the matter that "gait parameters" are "derived," and "a step of measuring an (SLS) duration" before the Amendment is more limited, it is aimed at restriction of the scope of claims prescribed in Article 17-2(5)(ii) of the Patent Act. Then, it will be examined below whether or not the invention according to Claim 1 after the Amendment described in 1 (2) above (hereinafter, referred to as "Amended Invention") falls under the provisions of Article 126 (7) of the Patent Act which is applied mutatis mutandis pursuant to Article 17-2 (6) of the Patent Act (whether or not a patent can be granted independently at the time of patent application).

A Regarding a step of removing noise

(A) Regarding a step of removing a plurality of noises from the captured skeleton data, Amended Invention has specified as "the plurality of noises include one or more errors, and the plurality of noises are removed by the following steps (a) to (c):

(a) converting the captured skeleton data into a set of features related to a physical structure of the person,

(b) computing static features of the physical structure in each frame, and

(c) tracking changes in the static features on the basis of front and rear frames".

(B) Regarding the removal of noises, the specification describes as follows.

"[0024]

According to an embodiment of the disclosure, the noise cleaning module 108 is configured to remove the plurality of noises from the skeleton data acquired from the person using Kinect sensor 102. The noises in skeleton data are practically visible when the person is completely stationary, but the joint positions recorded by Kinect sensor 102 vary over time. There are many parameters that affect the characteristics and level of noise, which include room lighting, IR interference, subject's distance from Kinect sensor, location of sensor array, quantization, rounding errors introduced during computations, etc. In order to get skeleton data cleaned, they are converted into a large set of features related to subject's physical structure using the noise cleaning module 108. In each frame, the static features such as length of arms, legs, height, etc. are computed and the changes are tracked with two previous and two following frames. The data after noise cleaning are used as input to the gait parameter estimation module 110 and the static SLS measurement module 112".

(C) Judgment

a It is unclear what "the plurality of noises include one or more errors" tries to specify.

Noises are unnecessary signals other than the signal to be processed; that is, undesired noisy signals. On the other hand, concerning errors, it is described as "includes rounding errors introduced during computations, etc." in the specification of the present invention, and "rounding errors" are generated by calculation processing such as rounding. Then, "noises" and "errors" are physically and mathematically different events, and even if referring to the specification of the present application, it is not obvious that "the plurality of noises include one or more errors". Furthermore, even if it is literally interpreted as "the plurality of noises include one or more errors," removing noise is also understood as removing the "error" caused by the calculation process, and it is unclear in this meaning.

b "Removing a plurality of noises from the captured skeleton data" is carried out by "(a) converting the captured skeleton data into a set of features related to a physical structure of the person, (b) computing static features of the physical structure in each frame, and (c) tracking changes in the static features on the basis of front and rear frames," and "features related to a physical structure of the person" and "static features of the physical structure" are tentatively understood as "length of arms, legs, height, etc." in accordance with the specification of the present application. Therefore, although "changes in the static features are tracked on the basis of front and rear frames" through the steps of (a) and (b) above; that is, changes in "length of arms, legs, height, etc." are tracked on the basis of front and rear frames, it is unclear how tracking changes in "length of arms, legs, height, etc." would "remove a plurality of noises from the skeleton data".

In this regard, since there is no description about a method of "removing a plurality of noises from the skeleton data" by tracking changes in "length of arms, legs, height, etc." in the specification of the present application, it cannot be said that the detailed description of the invention is clearly and sufficiently described as to enable a person skilled in the art to work Amended Invention.

(D) Summary

Therefore, in a step of removing noises, Amended Invention does not meet the requirement stipulated in Article 36(6)(ii) of the Patent Act, and the detailed description of the invention does not meet the requirement stipulated in Article 36(4)(i) of the Patent Act.

B Regarding a step of calculating gait parameters

(A) In Amended Invention, a step of calculating gait parameters has been specified as

"(d) obtaining a velocity profile of a corresponding ankle, and

(e) computing curvature points that are two points indicating the beginning of two continuous stance phases of a specific leg, on the basis of the velocity profile,

(f) detecting a peak region and a trough region from the velocity profile to obtain a set of data points of the peak region and the trough region,

(g) computing covariance matrix of normalized data obtained by calculating mean and standard deviation of the set of the data points, and

(h) computing the eigenvalue decomposition of the covariance matrix to perform an eigenvector based curvature analysis and obtain a curvature point indicating the beginning of a swing phase with respect to the leg, wherein an eigenvector corresponding to a minimum eigenvalue provides a direction of a minimum fluctuation of the set of the data points and clarifies a direction toward the curvature point of the beginning of the swing phase, and the curvature point of the beginning of the swing phase, the curvature points of the beginning of the two continuous curvature points, and the set of the data points detected in the peak region and the trough region of the velocity profile are used for calculating the plurality of gait parameters".

(B) Regarding calculating gait parameters, the specification of the present application describes as follows.

"[0027]

Further, the gait parameter detection module 110 is configured to employ a standard second derivative based curvature detection algorithm to detect two negative curvature points 'A' and 'S1'. The left ankle's velocity profile 300 along with its variation in X-direction is shown in FIG. 5. As is well known to a person skilled in the art, the ankle attains maximum horizontal velocity during swing phase (between 'B' and 'S1' as shown in FIG. 5) and almost zero horizontal velocity in stance phase (between 'A' and 'B'). FIG. 5 shows substantial changes in the left ankle's velocity $V_{AnkleLeft}$ at points 'T1', 'T2', and 'P'. Keeping this fact in mind, the corresponding ankle's (here left ankle's) velocity profile has been used to compute the desired curvature points 'A' and 'S1'. Specifically, these points will serve as markers in the proposed method. Before doing curvature analysis, a standard peak and trough detection algorithm is employed to detect peak ('P') and trough ('T1', 'T2') from the velocity profile as shown in FIG. 5. Final data points X in region 'T1' to 'P' and region 'P' to 'T2' are considered for curvature analysis. For this it was assumed that the curvature points will lie in the direction of minimum variance of data. In the next step,
of normalized data,
[Expression 1]

$$\ddot{X}$$

covariance matrix
[Expression 2]

$$\ddot{X}\ddot{X}^{T}$$

is computed (i.e.
[Expression 3]

$$\ddot{X} = X - X' / \sigma$$

, where X' and σ are mean and standard deviation of X respectively).
[0028]

Further the eigenvalue decomposition of the matrix is computed. It should be appreciated that the principal component analysis (principal component analysis (PCA))) also uses the same principle to find the direction of maximum variance. The eigenvector (referred to as Emin) corresponding to the least eigenvalue provides the direction of minimum variance of the data and so reveals the direction towards curvature point. FIG. 6 shows the two direction vectors 400 obtained from eigen decomposition of covariance matrix. The curvature point 'B' (between arc 'T1' to 'P') is obtained through computing minimum projection error of the eigenvector corresponding to smallest eigenvalue and it is computed using the following equation:

[Expression 4]

$$\underset{r}{\operatorname{argmin}}[\vec{P}_r - (P_r.\hat{u})u]$$

Where

[Expression 5]

$$\vec{P}_r$$

is the original signal value ($X_{AnkleLeft}$ (r)) at frame r (or time instance t),

[Expression 6]

$$\hat{u}$$

is the unit vector along

[Expression 7]

$$\vec{E}_{min}$$

.

The frame (point) 'S1' is computed in similar manner, where the data between 'P1' and 'T2' frames are used for eigenvector based curvature analysis. Finally, the stride length and time are measured by finding differences between displacement and time-stamp corresponding to 'A' and 'S' frames respectively. The curvature point 'B' indicates the beginning of swing phase ('B' to 'S1' with respect to FIG. 5) preceded by a stance phase ('A' to 'B' with respect to FIG. 5). Thus, all four of the gait variables are modeled using the following equations.

Stride length=|$X_{AnkleLeft}$ (at 'A')–$X_{AnkleLeft}$ (at 'S1')|,

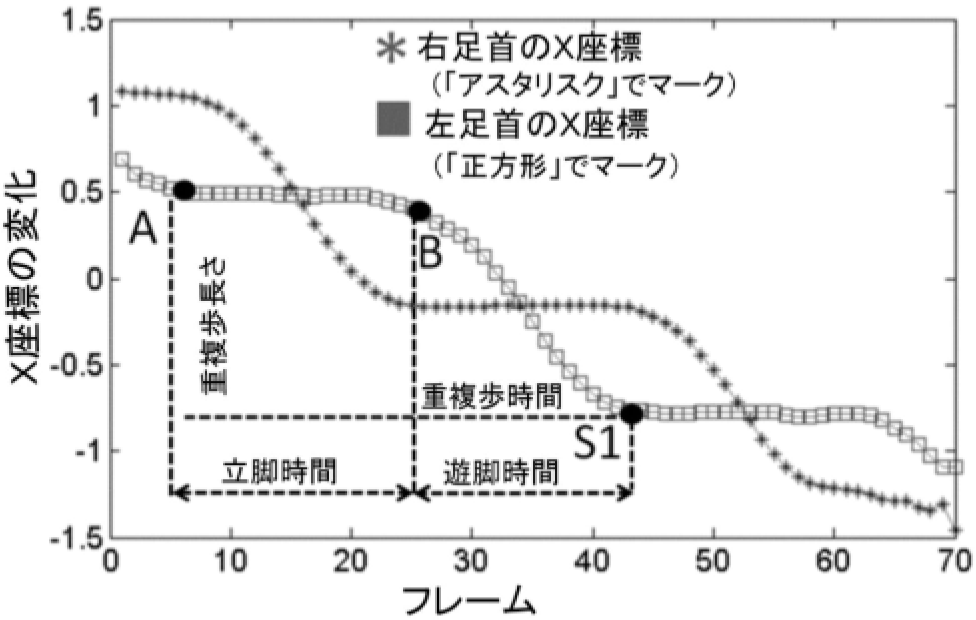
Stride time=|timestamp (at 'A')–timestamp (at 'S1')|,

Swing time=|timestamp (at 'S1')–timestamp (at 'B')|,

Stance time=|$X_{AnkleLeft}$ (at 'B')–$X_{AnkleLeft}$ (at 'A')|"

Further, the following drawings are described as FIG. 4, FIG. 5 and FIG. 6.

[FIG. 4]



Ｘ座標の変化　Variation in x coordinates

重複歩長さ　Stride length

立脚時間　Stance time

重複歩時間　Stride time

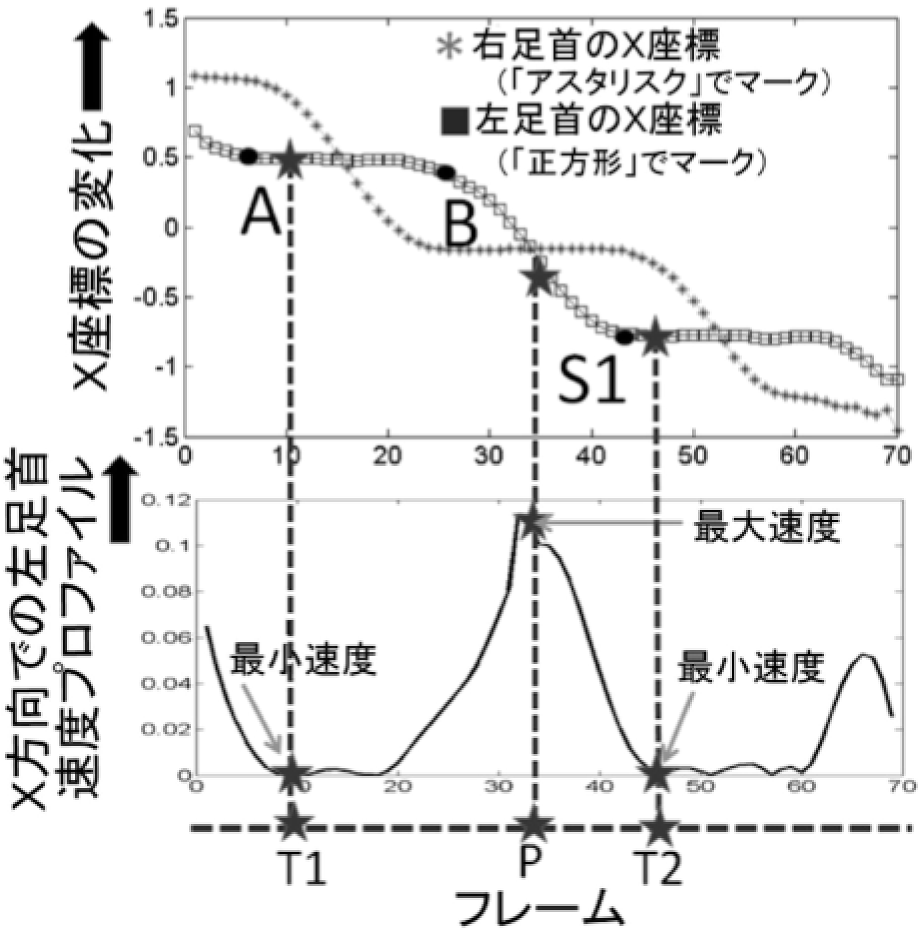
遊脚時間　Swing time

フレーム　Frame

右足首のＸ座標（「アスタリスク」でマーク）　x coordinates of a right ankle (marked with "an asterisk")

左足首のＸ座標（「正方形」でマーク）　x coordinates of a left ankle (marked with "a square")

[FIG. 5]



Ｘ座標の変化　　Variation in x coordinates

Ｘ方向での左足首速度プロファイル　　Left ankle's velocity profile in X-direction

最小速度　　Minimum velocity

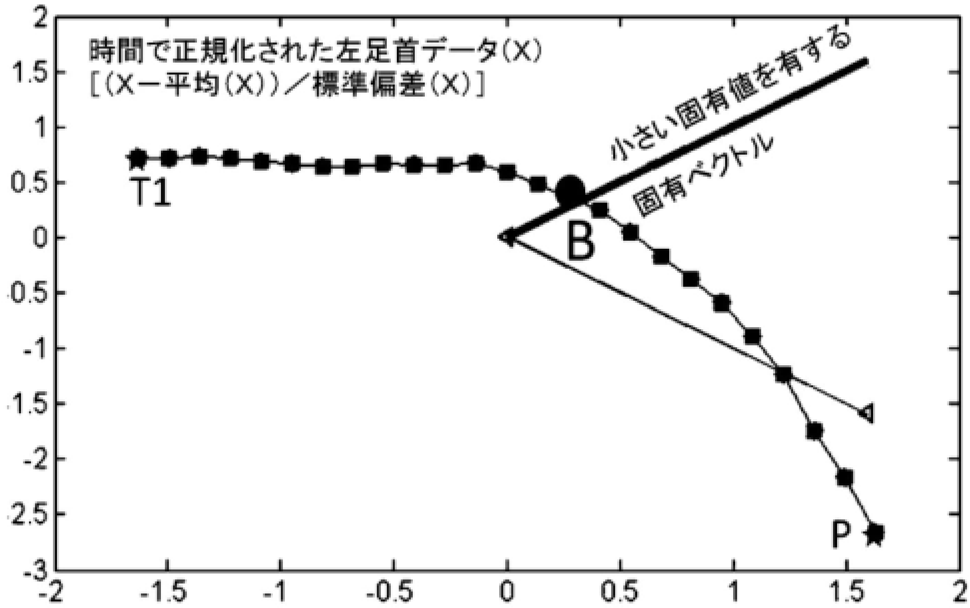
最大速度　　Maximum velocity

フレーム　　Frame

右足首のＸ座標（「アスタリスク」でマーク）　　x coordinates of a right ankle (marked with "an asterisk")

左足首のＸ座標（「正方形」でマーク）　　x coordinates of a left ankle (marked with "a square")

[FIG. 6]



時間で正規化された左足首データ（Ｘ） Left ankle's data normalized with time (X)

［（Ｘ－平均（Ｘ））／標準偏差（Ｘ）］ [(X-average(X))/standard deviation (X)]

小さい固有値を有する固有ベクトル Eigenvector with a small eigenvalue

(C) Judgment

a Regarding "(e) computing curvature points that are two points indicating the beginning of two continuous stance phases of a specific leg, on the basis of the velocity profile," as far as in "curvature points that are two points indicating the beginning of two continuous stance phases," it can be understood that they are T1 and T2 in FIG. 5 above. However, it is unclear what "two continuous stance phases of a specific leg" are trying to specify. "A specific leg" means a right leg or a left leg, and there is "a swing phase" between two "stance phases", so that the two "stance phases" are not continuous. In this regard, since there is no description of "two continuous stance phases" in the specification of the present application, it is unclear even if referring to the specification of the present application.

b Regarding "(f) detecting a peak region and a trough region from the velocity profile to obtain a set of data points of the peak region and the trough region, (g) computing covariance matrix of normalized data obtained by calculating mean and standard deviation of the set of the data points," it is assumed that a peak region and a trough region are a crest part and a flat part in FIG. 5 (left ankles' velocity profile in X direction) respectively, and that "a set of data points of the peak region and the trough region" is a set of actual measurement data (velocity) corresponding to each point (vertical axis: velocity) with respect to (lateral axis: frame (time)) in the peak region and the trough region. Then, based on that assumption, by making these actual measurement data "normalized data obtained by calculating mean and standard deviation," it can be understood that a smooth curve as shown in FIG. 5 is drawn.

However, concerning the "data," there is a description "computing covariance matrix of data," and since "covariance" mathematically looks at the correlation of multiple elements, there are elements other than "velocity", and it can be said that the "covariance" matrix is calculated by including the values of velocity and other elements. Therefore, the assumption that "a set of data points of the peak region and the trough region" is the actual velocity measurement data does not hold.

In this regard, the specification of the present application merely describes that "is employed to detect peak ('P') and trough ('T1', 'T2') from the velocity profile as shown in FIG. 5. Final data points X in region 'T1' to 'P' and 'P' to 'T2' are considered for curvature analysis," so that it is unclear even referring to this.

Therefore, it is unclear what kind of a set of data points is specified by "a set of data points of the peak region and the trough region".

c Regarding "(h) computing the eigenvalue decomposition of the covariance matrix to perform an eigenvector based curvature analysis and obtain a curvature point indicating the beginning of a swing phase with respect to the leg, wherein an eigenvector corresponding to a minimum eigenvalue provides a direction of a minimum fluctuation of the set of the data points," although it is not clear about the elements that make up the "covariance matrix", calculating the eigenvalue decomposition of the covariance matrix to find the eigenvectors corresponding to the minimum eigenvalues and providing a direction of a minimum fluctuation are mathematically known as principal component analysis. However, regarding "to perform an eigenvector based curvature analysis and obtain a curvature point indicating the beginning of a swing phase with respect to the leg," although it can be understood that "a curvature point indicating the beginning of a swing phase with respect to the leg" a "B" point in FIG. 5 and FIG. 6, it cannot be said that it is clear why the B point becomes "an eigenvector corresponding to a minimum eigenvalue" which "provides a direction of a minimum fluctuation of the set of the data points" (even referring to FIG. 6, it might not be said that it is a point of a minimum fluctuation), and further, although analyzing curved surfaces geometrically using eigenvector is generally known, it cannot be said that it is clear what kind of analysis "an eigenvector based curvature analysis" performs.

In this regard, the specification of the present application merely describes "the frame (point) 'S1' is computed in a similar manner, where the data between 'P1' and 'T2' frames are used for eigenvector based curvature analysis," and does not indicate the specific calculation.

Further, regarding "eigenvector based curvature analysis," since the specific content and calculation theory are unknown in a notice of reasons for refusal dated March 22, 2018, it is notified that it does not meet clarity and enablement requirements, whereas the Appellant has responded by eliminating it and has not given any explanation.

Therefore, it is unclear as to what is meant by "to perform an eigenvector based curvature analysis and obtain a curvature point indicating the beginning of a swing phase with respect to the leg, wherein an eigenvector corresponding to a minimum eigenvalue provides a direction of a minimum fluctuation of the set of the data points," and it cannot be said that the detailed description of the invention is clearly and sufficiently described as to enable a person skilled in the art to work the invention.

d Regarding "the curvature point of the beginning of the swing phase, the curvature points of the beginning of the two continuous curvature points, and the set of the data points detected in the peak region and the trough region of the velocity profile are used for calculating the plurality of gait parameters," referring to the descriptions of the specification of the present application (FIG. 4), "calculating gait parameters" requires "A," "B", and "S1". Although "the curvature point of the beginning of the swing phase" is the point "B" in FIGS. 4, 5, and 6, "the curvature points of the beginning of the two continuous curvature points" are the points "T1, T2" in FIG. 5, and "A" and "S1" are not specified as the description of claims. Although it can be said that "A" and "S1" can be obtained from "the set of the data points detected in the peak region and the trough region," it cannot be said that it is clear to describe only the point "B" and the points "T1, T2" as those "used for calculating the plurality of gait parameters".

(D) Summary

Therefore, in a step of calculating gait parameters, Amended Invention does not meet the requirement stipulated in Article 36(6)(ii) of the Patent Act, and the detailed description of the invention does not meet the requirement stipulated in Article 36(4)(i) of the Patent Act.

C Regarding a step of measuring an (SLS) duration

(A) Regarding a step of measuring a static single limb stance (SLS) duration of the person, Amended Invention has specified as

"(i) obtaining changes in the tracked ankle coordinates of the person, and

(j) executing the eigenvector based curvature analysis with respect to the obtained changes in the tracked ankle coordinates to determine two negative curvature points, wherein a duration between the decided negative curvature points is a static SLS duration".

(B) For the measurement of the (SLS) duration, the specification of the present application describes as follows.

"[0030]

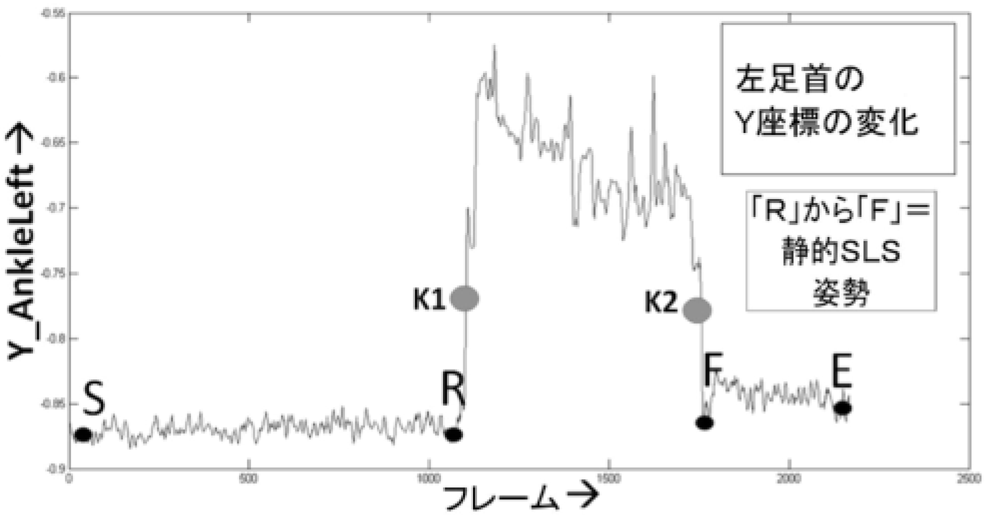
According to an embodiment of the disclosure, the static SLS measurement module 112 is used for analyzing the postural balance of the person. The postural balance is measured using the static SLS exercise. The static SLS exercise is all about raising one leg off the ground and maintaining body balance by the other leg. The experiment using static SLS exercise focuses on the variation in y-coordinate. The variation in the left ankle's y-coordinate (left leg is lifted) $Y_{AnkleLeft}$ gives information about the precise timing when the person raises his/her leg (here, left-leg) off the ground as shown in FIG. 7. FIG. 7 shows variation in $Y_{AnkleLeft}$ at frames 'R' and 'F'. The zone 'R' to 'F' is the desired zone of SLS posture. To put things into perspective, 'R' is the frame where the foot is flexed off the floor and 'F' is the frame where it again touches the ground. The duration between 'R' and 'F' is considered as the static SLS duration.

[0031]

In order to detect those frames, k-means clustering algorithm is employed to capture the variation in $Y_{AnkleLeft}$ over frames. It will in turn help in differentiating one leg stance portion (zone 'R' to 'F'). FIG. 7 also shows the output of k-means clustering algorithm; i.e. frames 'K1' and 'K2' which are far away from the desired frames 'R' and 'F'. Finally, the proposed curvature analysis algorithm is used to find the curvature points 'R' and 'F' given data points in the region 'S' to 'K1' and 'K2' to 'E' respectively".

Then, as FIG. 7, the following drawing is described.

[FIG. 7]



左足首のＹ座標の変化　　Variation in the left ankle's y-coordinate
「Ｒ」から「Ｆ」＝静的ＳＬＳ姿勢　　"R" to "F" = static SLS posture
フレーム　　Frame

(C) Judgment

a　Regarding "executing the eigenvector based curvature analysis with respect to the obtained variation in the tracked ankle coordinates to determine two negative curvature points," it is not clear what "executing the eigenvector based curvature analysis with respect to the obtained changes" specifies to do.

In this regard, the specification of the present application describes that "In order to detect those frames, k-means clustering algorithm is employed to capture the variation in YAnkleLeft over frames.　It will in turn help in differentiating one leg stance portion (zone 'R' to 'F').　FIG. 7 also shows the output of k-means clustering algorithm; i.e. frames 'K1' and 'K2' which are far away from the desired frames 'R' and 'F'.　Finally, the proposed curvature analysis algorithm is used to find the curvature points 'R' and 'F' given data points in the region 'S' to 'K1' and 'K2' to 'E' respectively," so that it is described that variation in the obtained ankle's coordinates are obtained by k-means clustering algorithm, and the proposed curvature analysis algorithm is executed with respect to that to find the curvature points 'R' and 'F'".

Although the k-means clustering algorithm is a means used when classifying data clusters, it cannot be said that it is clear what executing "the proposed curvature analysis algorithm" on the data classified by it does, and how to "determine" "two negative curvature points" by it.

Further, in a notice of reasons for refusal dated September 21, 2018, it is notified that referring FIG. 7, there is no such thing as "curvature" and it is not clear to measure the SLS duration with the "curvature detection algorithm" (a compilation of "the k-means clustering algorithm" and "the proposed curvature analysis algorithm"), whereas the Appellant has responded by eliminating it and has not given any explanation.

Therefore, it is unclear what is meant by the matter "executing the eigenvector based curvature analysis with respect to the obtained changes in the tracked ankle coordinates to determine two negative curvature points," and it cannot be said that the detailed description of the invention is described clearly and sufficiently as to enable a person skilled in the art to work the invention.

b Regarding "to determine two negative curvature points, wherein a duration between the decided negative curvature points is a static SLS duration," although "two" "curvature points" are the points "R" and "F" in FIG. 7, it cannot be technically properly understood that both are "negative curvatures".

In this regard, in the part of the specification of the present application, which is mentioned in "regarding calculating gait parameters," there is a description that "the gait parameter detection module 110 detects two negative curvature points 'A' and 'S1'"([0027]), and although it can be understood that both "A" and "S1" are "negative curvatures," it cannot be understood that both the point "R" and the point "F" are "negative curvatures".

Therefore, the description that "to determine two negative curvature points, wherein a duration between the decided negative curvature points is a static SLS duration" is unclear.

(D) Summary

Therefore, in a step of measuring an (SLS) duration, Amended Invention does not meet the requirement stipulated in Article 36(6)(ii) of the Patent Act, and the detailed description of the invention does not meet the requirement stipulated in Article 36(4)(i) of the Patent Act.

D Summary of independent requirements for patentability

Therefore, in the points of A to C above, since Amended Invention does not meet the requirement stipulated in Article 36(6)(ii) of the Patent Act, and the detailed description of the invention does not meet the requirement stipulated in Article 36(4)(i) of the Patent Act, a patent should not be granted independently at the time of patent application.

3 Closing on the Amendment

Consequently, since the Amendment violates the requirements defined in Article 17-2(2)(v) of the Patent Act, and violates the provisions of Article 126 (7) of the Patent Act which is applied mutatis mutandis pursuant to Article 17-2 (6) of the Patent Act, the Amendment shall be dismissed under the provisions of Article 53(1) of the Patent Act applied mutatis mutandis by replacing certain terms pursuant to Article 159(1) of the Patent Act.

Accordingly, in conclusion, the above-mentioned decision to dismiss the amendment has been made.

No. 3 Regarding the invention

1 The Invention

As the Amendment was dismissed as described above, the inventions according to Claims 1 to 8 of the present application are as specified by the matters described in Claims 1 to 8 of the scope of claims which have been amended by the written amendment made on August 13, 2018, and the inventions according to Claims 1 to 3 are as follows (Claim 1 has been described in No. 2 [Reason] 1 (1) above, but will be shown again.).

"[Claim 1]

A method for analyzing postural balance of a person, the method comprising a processor implementing steps of:

capturing skeleton data of the person using a 3D motion sensor;

removing a plurality of noises from the captured skeleton data using a noise cleaning module;

tracking ankle coordinates of the person from the captured skeleton data in x plane and y plane;

estimating the postural balance of the person on the basis of a plurality of gait parameters derived from the tracked ankle coordinates of the person; and

measuring a static single limb stance (static single limb stance (SLS)) duration of the person, wherein the SLS duration is indicative of the postural balance of the person".

(Hereinafter, referred to as "the Invention".)

"[Claim 3]

The method according to Claim 1, further comprising a step of comparing the SLS duration of the person with an SLS measured using a curvature detection algorithm".

2 Reasons for refusal stated in the examiner's decision

The outline of the reasons for refusal stated in the examiner's decision is as follows.
1. (New matter) Since the amendment in the written amendment dated August 13, 2018 was not made within the scope of the matters described in the translation and the like of the foreign language document (the specification, scope of claims, or drawings after the Amendment by a written correction of mistranslation), it does not meet the requirements stipulated in Article 17-2(3) of the Patent Act.
2. (Inventive step) Since the inventions according to the following claims of the present application could have been easily invented by a person having ordinary skill in the art to which the inventions pertain prior to the filing of the application, on the basis of the inventions described in the publications listed below which were distributed or made available to the public through electric telecommunication lines in Japan or foreign countries prior to the filing of the application, a payent should not be granted for the Invention under the provisions of Article 29(2) of the Patent Act.
3. (Clarity) The application does not meet the requirements stipulated in Article 36(6)(ii) of the Patent Act.

Regarding Reason 1 (New matter)

The amendment according to Claims 1 to 8 by the written amendment dated August 13, 2018, includes amending to "estimating the postural balance of the person on the basis of a plurality of gait parameters derived from the tracked ankle coordinates of the person".

However, in the translation of the foreign language document, although it is described that postural balance is measured from a static SLS duration, it cannot be recognized that it is described that postural balance is estimated from gait parameters, and it cannot be recognized that this matter is obvious for a person skilled in the art.

Therefore, it cannot be said that this amendment is made within the scope of the matters described in the translation of the foreign language document.

Regarding Reason 2 (inventive step)

· Claims 1-2, 4-8

· Cited Documents and the like 1-2

1. International Publication No. WO2014/112632

2. Richard W. Bohannon, Single Limb Stance Times: A Descriptive Meta-Analysis of Data from Individuals at Least 60 Years of Age, Topics in Geriatric Rehabilitation, 2006, Vol. 22 No. 1, pp. 70-77

Regarding Reason 3 (clarity)

(1) Although in Claims 1, and 7-8, it is described that it comprises "a step of" "measuring a static single limb stance (static single limb stance (SLS)) duration of the person, wherein the SLS duration is indicative of the postural balance of the person," the relationship between the step and other steps (steps of capturing skeleton data, tracking ankle coordinates, and estimating the postural balance on the basis of gait parameters) is unclear.

That is, according to the current description, it cannot be recognized to use skeleton data, ankle coordinates, and gait parameters for calculating a static single limb stance duration, and the relationship between the respective steps is unclear. (including a case that there is no relation). Hence, the inventions according to Claims 1, and 7-8 are unclear.

(2) In Claim 3, it is described that comparison is performed using the SLS duration (recognized as "a static single limb stance duration") measured using a curvature detection algorithm. However, even considering the specification of the present application (especially, [FIG. 7]) and common general technical knowledge at the time of filing the application, it is no recognized that it is clear how to measure a static single limb stance duration using a curvature detection algorithm (considering FIG. 7, it is not recognized that there is something that can be called "curvature," and it is not currently accepted that a person skilled in the art can calculate the static single limb stance duration from the graph using the curvature detection algorithm.). Hence, the invention according to Claim 3 is unclear.

(3) Regarding "the skeleton data" in "tracking ankle coordinates of the person from the captured skeleton data in x plane and y plane," it is unclear whether it means skeleton data obtained using a 3D motion sensor, or skeleton data after removing a plurality of noises. Hence, the inventions according to Claims 1, and 7-8 are unclear.

3 Judgment by the body

(1) Regarding Reason 1

Although in the translation of the foreign language document (hereinafter, the original translated specification, scope of claims, drawings are referred to as "the translation and the like"), there is a description that "according to an embodiment of the disclosure, the static SLS measurement module 112 is used for analyzing the postural balance of the person" ([0030]), there is no direct description of "estimating the postural balance of the person on the basis of gait parameters".

As the result of examination, calculating gait parameters is described in described in a section mentioned in No. 2-2 (2) B (B) above, and measuring the (SLS) duration is described in a section mentioned in No. 2-2 (2) C (B) above. The former is measured while walking, whereas the latter is measured while raising one leg off the ground and maintaining body balance by the other leg, so that measuring states are different.

Therefore, it cannot be said that estimating the postural balance analyzed by measuring while raising one leg off the ground and maintaining body balance by the other leg, on the basis of parameters derived when measuring it while walking that is another measuring state, does not introduce new technical matters in a relation to the technical matter that is derived by integrating all the descriptions in the translation and the like.

Further, in the written amendment dated February 22, 2019 to which a decision to dismiss the amendment had been made, the Appellant has responded to Reason 1 by eliminating it.

Therefore, the amendment in the written amendment dated August 13, 2018 was not made within the scope of the matters described in the translation and the like, and thus does not meet the requirements stipulated in Article 17-2(3) of the Patent Act.

(2) Regarding Reason 3

A Regarding (1) of Reason 3 of 2 above, in the written opinion dated February 22, 2019, the Appellant alleged that "in Claim 1, 'measuring a static single limb stance (static single limb stance (SLS)) duration of the person, wherein the SLS duration is indicative of the postural balance of the person' was amended to 'measuring the stride distance, the stride time, swing time, and stance time by analyzing a plurality of space-time changes of the captured skeleton data'. This description is completely clear, and it is recognized that skeleton data, ankle coordinates, and gait parameters are used in the calculation of a static single limb stance. Therefore, (1) of Reason 3 has been resolved".

With reference thereto, although the Appellant alleges it was clarified by the Amendment, since the Amendment was dismissed, it cannot be said that the relationship between the respective steps is clear.

B Regarding (2) of Reason 3 of 2 above, in the written amendment dated February 22, 2019 to which a decision to dismiss the amendment had been made, the Appellant has responded thereto by eliminating it.

Therefore, it cannot be said that (2) of Reason 3 of 2 above has be resolved.

C Regarding (3) of Reason 3 of 2 above, in the written opinion dated February 22, 2019, the Appellant states that "the limitation of the claims refers to removing a plurality of noises, and it is obvious that the claimed invention refers to skeletal data after the plurality of noises have been removed," but regarding the designated point, it was not limited in the written amendment dated February 22, 2019 to which a decision to dismiss the amendment had been made, and further, in the Invention, since it is described as "tracking ankle coordinates of the person from the captured skeleton data in x plane and y plane," it must be said that it is unclear whether it means "the captured skeleton data" according to the context or "skeleton data after the plurality of noises have been removed" added with technical consideration.

(3) Regarding Reason 2

As judged in (1) and (2) above, the Invention includes new matters, and although it is not in a state where it can be examined in detail since it is unclear, is not enough to recognize the inventive step as described below.

A Regarding Cited Document

(A) Cited Document 1

a. Cited Document 1, distributed before the priority date of the present application and cited in Reason 2 of the examiner's decision, describes the following matters.

(1a) "[0009] (First Embodiment)

FIG. 1 is a view illustrating an example of a configuration of a motion information processing apparatus 100 according to a first embodiment. The motion information processing apparatus 100 according to the first embodiment is, for example, an apparatus to support rehabilitation performed in a medical institution, at home, or in an office. Here, the 'rehabilitation' indicates a technique or a method to improve potential of a patient who has a handicap, a chronic disease, or a geriatric disease and is in a long treatment period, and to recover and advance a vital function and a social function. The technique or the method includes, for example, functional training to recover and advance a vital function and a social function. Here, as the functional training, there is, for example, walking training or range of joint motion training. Also, an object of rehabilitation will be referred to as an 'object person.' The object person is, for example, a sick person, an injured person, an elderly person, or a handicapped parson. Also, a person who helps an object person in rehabilitation will be referred to as a 'helper.' The helper is, for example, a healthcare professional, who works at a medical institution, such as a doctor, a physical therapist, or a nurse or a caregiver, a family member, or a friend who performs nursing-care of an object person at home. Also, rehabilitation will be simply referred to as 'rehab'.

[0010] As illustrated in FIG. 1, in the first embodiment, the motion information processing apparatus 100 is connected to motion information collecting circuitry 10.

[0011] The motion information collecting circuitry 10 detects a motion of a person, a substance, or the like in a space where rehabilitation is performed and collects motion information indicating the motion of the person, the substance, or the like. Note that the motion information will be described in detail when processing performed by a motion information generating circuitry 14 described later is described. Also, as the motion information collecting circuitry 10, for example, Kinect (registered trademark) is used.

[0012] As illustrated in FIG. 1, the motion information collecting circuitry 10 includes a color image collecting circuitry 11, a distance image collecting circuitry 12, a sound recognizing circuitry 13, and a motion information generating circuitry 14. Note that a configuration of the motion information collecting circuitry 10 illustrated in FIG. 1 is just an example and an embodiment is not limited thereto.

...

[0016] The motion information generating circuitry 14 generates motion information indicating a motion of a person, a substance, or the like. The motion information is generated, for example, by capturing a motion (gesture) of a person as a plurality of kinds of successive posture (pose). An outline is described as follows. That is, by pattern matching using a human body pattern, the motion information generating circuitry 14 first acquires coordinates of each joint, which forms a skeleton of a human body, from the distance image information generated by the distance image collecting circuitry 12. The coordinates of each joint which coordinates are acquired from the distance image information are values indicated by a coordinate system of a distance image (hereinafter, referred to as a 'distance image coordinate system'). Thus, the motion information generating circuitry 14 then converts the coordinates of each joint in the distance image coordinate system into a value indicated by a coordinate system of a three-dimensional space where rehabilitation is performed (hereinafter, referred to as a 'world coordinate system'). The coordinates of each joint which coordinates are indicated by the world coordinate system are skeleton information in one frame. Also, pieces of skeleton information in a plurality of frames are motion information. In the following, processing in the motion information generating circuitry 14 according to the first embodiment will be described in detail.

[0017] FIG. 2A to FIG. 2C are views for describing processing in the motion information generating circuitry 14 according to the first embodiment. In FIG. 2A, an example of a distance image generated by the distance image collecting circuitry 12 is illustrated. Note that in FIG. 2A, for convenience of description, an image expressed by a linedrawing is illustrated. However, an actual distance image is an image or the like expressed by color gradation corresponding to a distance. In the distance image, each pixel includes a three-dimensional value in which a 'pixel position X' in a right/left direction of the distance image, a 'pixel position Y' in an upward/downward direction of the distance image, and a 'distance Z' between an object corresponding to the pixel and the distance image collecting circuitry 12 are associated with each other. In the following, values of coordinates in the distance image coordinate system will be expressed as three-dimensional values (X, Y, Z).

[0018] In the first embodiment, the motion information generating circuitry 14 previously stores a human body pattern corresponding to various kinds of posture, for example, by learning. Each time distance image information is generated by the distance image collecting circuitry 12, and the motion information generating circuitry 14 acquires the generated distance image information in each frame. Then, the motion information generating circuitry 14 performs pattern matching with respect to the acquired distance image information in each frame by using a human body pattern.

[0019] Here, the human body pattern will be described. In FIG. 2B, an example of the human body pattern is illustrated. In the first embodiment, since being a pattern used for pattern matching with the distance image information, the human body pattern is expressed in the distance image coordinate system. Also, similarly to a person drawn onto a distance image, information of a surface of a human body (hereinafter, referred to as 'human body surface') is included. For example, the human body surface corresponds to a surface of a skin or clothing of the person. Moreover, as illustrated in FIG. 2B, the human body pattern includes information of each joint which forms a skeleton of a human body. That is, in the human body pattern, a relative positional relationship between the human body surface and each joint is already known.

[0020] In the example illustrated in FIG. 2B, the human body pattern includes information of 20 joints from a joint 2a to a joint 2t. Among these, the joint 2a corresponds to a head, the joint 2b corresponds to a center part of the both shoulders, the joint 2c corresponds to a loin, and the joint 2d corresponds to a center part of a hip. Also, the joint 2e corresponds to a right shoulder, the joint 2f corresponds to a right elbow, the joint 2g corresponds to a right wrist, and the joint 2h corresponds to a right hand. Also, the joint 2i corresponds to a left shoulder, the joint 2j corresponds to a left elbow, the joint 2k corresponds to a left wrist, and the joint 2l corresponds to a left hand. Also, the joint 2m corresponds to a right hip, the joint 2n corresponds to a right knee, the joint 2o corresponds to a right ankle, and the joint 2p corresponds to a right tarsus. Also, the joint 2q corresponds to a left hip, the joint 2r corresponds to a left knee, the joint 2s corresponds to a left ankle, and the joint 2t corresponds to a left tarsus".

[0021] Note that in FIG. 2B, a case where the human body pattern includes information of 20 joints has been described but an embodiment is not limited thereto. A position of a joint and the number of joints may be set arbitrarily by an operator. For example, in a case of only capturing a change in a motion of limbs, it is not necessary to acquire information of the joint 2b and the joint 2c among the joint 2a to the joint 2d. Also, in a case of capturing a change in a motion of a right hand in detail, a joint of each finger of the right hand may be newly set in addition to the joint 2h. Note that each of the joint 2a, the joint 2h, the joint 2l, the joint 2p, and the joint 2t in FIG. 2B is an end part of a bone and is different from a so-called joint. However, since being an important point indicating a position and a direction of a bone, each of these is described as a joint for convenience of description.

...

[0036] Referring back to FIG. 1, the motion information processing apparatus 100 performs processing to support rehabilitation by using the motion information output from the motion information collecting circuitry 10. More specifically, the motion information processing apparatus 100 generates and displays display information, with which it is possible to evaluate a walking condition, by using motion information of an object person performing walking training, which information is collected by the motion information collecting circuitry 10. Also, the motion information processing apparatus 100 analyzes the motion information of the object person performing the walking training, which information is collected by the motion information collecting circuitry 10.

[0037] As described above, conventionally, walking training has been performed as a kind of functional training of rehabilitation. In the walking training, walking executed by the object person is observed by a doctor, a physical therapist, or the like and a walking condition of the object person is evaluated. For example, in the walking training, various walking conditions such as a step pattern, a shake of an upper body, velocity of walking, a stride, and a step interval are evaluated. Here, conventionally, there is a case where there is a difference in evaluation of the walking condition between doctors and physical therapists. Thus, the motion information processing apparatus 100 according to the present embodiment is configured to provide display information, with which it is easier to evaluate a walking condition, in such a manner that a difference in evaluation of the walking condition is controlled. Also, the motion information processing apparatus 100 according to the present embodiment is configured to analyze a walking state including a landing point of a foot in walking of an object person in such a manner that it becomes easy to evaluate a walking condition.

[0038] For example, the motion information processing apparatus 100 is an information processing apparatus such as a computer or a workstation and includes output circuitry 110, input circuitry 120, the storage circuitry 130, and controlling circuitry 140 as illustrated in FIG. 1.

...

[0056] Next, a detail of the controlling circuitry 140 of the motion information processing apparatus 100 will be described. As illustrated in FIG. 4, in the motion information processing apparatus 100, the controlling circuitry 140 includes, for example, an obtaining circuitry 1401, an analyzing circuitry 1402, a generating circuitry 1403, and a display controlling circuitry 1404.

[0057] The obtaining circuitry 1401 obtains motion information of an object person who executes walking training. More specifically, the obtaining circuitry 1401 obtains the motion information collected by the motion information collecting circuitry 10 and stored in the motion information storage circuitry 1301. For example, according to analysis contents by the analyzing circuitry 1402 described later, the obtaining circuitry 1401 obtains at least one of color image information, distance image information, a sound recognition result, and skeleton information stored in each frame by the motion information storage circuitry 1301.

[0058] For example, when a landing point of a foot, an angle, velocity, and the like are analyzed by the analyzing circuitry 1402 described later, the obtaining circuitry 1401 obtains all pieces of color image information, distance image information, and skeleton information related to a series of walking motions in walking training of an object person.

[0059] The analyzing circuitry 1402 executes various kinds of analysis by using motion information of an object person who executes a walking motion, which information is obtained by the obtaining circuitry 1401. More specifically, by using the motion information, which is obtained by the obtaining circuitry 1401, such as the color image information, the distance image information, the sound recognition result, and the skeleton information, the analyzing circuitry 1402 calculates analysis information such as a landing point of a foot, an angle, velocity, acceleration, the number of steps, a stride, an overlapped walking distance, a step interval, and a walking rate of the object person during walking and stores a calculated analysis result into the analysis information storage circuitry 1302.

[0060] First, a case of analyzing a landing point of a foot will be described. FIG. 7A and FIG. 7B are views for describing an example of an analysis of a landing point of a foot performed by the analyzing circuitry 1402 according to the first embodiment. In FIG. 7A and FIG. 7B, a case of calculating a landing point of a foot of an object person by using skeleton information in the motion information collected by the motion information collecting circuitry 10 is illustrated. FIG. 7A schematically illustrates skeleton information in one frame, which information is collected by the motion information collecting circuitry 10. Also, FIG. 7B illustrates an example of calculation of a landing point of a foot.

...

[0069] Also, as described above, in addition to determination of landing of a foot, the analyzing circuitry 1402 can make determination that a foot is in the air. For example, when a change in a value of the z coordinate in a unit time exceeds a predetermined threshold, the analyzing circuitry 1402 determines that the foot is in the air. Also, for example, when a value of the y coordinate exceeds a predetermined threshold, the analyzing circuitry 1402 determines that the foot is in the air. Also, for example, when a value of the x coordinate changes little by little, the analyzing circuitry 1402 determines that the foot is in the air. Then, the analyzing circuitry 1402 determines that an opposite foot of the foot determined to be in the air is on the ground. For example, when a right foot is in the air during walking, the analyzing circuitry 1402 can determine that a left foot is on the ground. Also, by previously inputting coordinates of the ground into a system, the analyzing circuitry 1402 can determine that a foot is on the ground when the foot becomes close to the coordinates of the ground.

...

[0096] Here, for example, as illustrated in FIG. 10C, the generating circuitry 1403 can generate track information in which a footprint of when a body shakes or loses a balance is emphasized. For example, as illustrated in FIG. 10C, the generating circuitry 1403 can generate track information in which a fifth footprint is emphasized".

(1b) "[0300] (Fifth Embodiment)

Next, a configuration of a motion information processing apparatus 100b according to the fifth embodiment will be described. Based on the configuration described in the first embodiment (configuration illustrated in FIG. 1), the motion information processing apparatus 100b according to the fifth embodiment makes it possible to perform a clinically useful gait analysis with a configuration described in detail in the following. In the following, a case where an object person who performs a walking motion walks from the back of a room to the front thereof will be described as an example. Note that an embodiment is not limited to this. For example, application to a case of walking from the front of the room to the back thereof can also be performed.

...

[0302] The depth image information storage circuitry 1306 stores depth image information generated by motion information collecting circuitry 10. For example, the depth image information storage circuitry 1306 stores, in each frame, depth image information generated by the motion information collecting circuitry 10. Note that as described above, depth image information in one frame is information in which photographing time information, positional information of each pixel included in a photographing range, and a depth of each pixel are associated with each other. Also, as described above, the depth image information is information to which depth information is associated instead of distance information associated with each pixel of distance image information. Each pixel position can be indicated in a distance image coordinate system similar to that of the distance image information. Also, the depth image information is stored into the depth image information storage circuitry 1306 each time being generated by the motion information collecting circuitry 10.

...

[0316] As illustrated in FIG. 34, when the depth image 90 in the frame T is obtained by the obtaining circuitry 1408, the extracting circuitry 1409 subtracts, in each pixel, a depth of the depth image 90 in the frame T-1 from a depth of the depth image 90 in the frame T. Then, the extracting circuitry 1409 generates the binary image 92 in the frame T by performing binarization with a pixel in which the subtracted value is equal to or larger than a threshold in white and a pixel smaller than the threshold in black. In the binary image 92, a region of the black pixel indicates a position of what has a movement smaller than a threshold in a depth direction between the frame T-1 and the frame T. For example, a position of a substance such as a floor, a wall, a desk, or a chair is indicated. Also, a region of the white pixel indicates a position of what has a movement equal to or larger than the threshold in the depth direction between the frame T-1 to the frame T. For example, a position of a photographed person (object) is indicated. That is, the extracting circuitry 1409 extracts an object region 93, which indicates a position of an object person who executes a walking motion, by identifying what has no movement and what has a movement. Note that in FIG. 34, a case of calculating a difference in depth image information between two adjoining frames (frame T and frame T-1) in order to extract what has a movement has been described, but this is not a limitation. For example, a difference in depth image information between the frame T and a frame T-t (t is integer number equal to or larger than one) may be calculated. More specifically, for example, the extracting circuitry 1409 may extract what has a movement by subtracting a depth of a depth image 90 in a frame T-2 from a depth of the depth image 90 in the frame T in each pixel with the obtaining circuitry 1408 and performing binarization based

on determination whether the subtracted value is equal to or larger than a threshold.
[0317] Also, the extracting circuitry 1409 performs noise removing processing to remove a noise from the generated binary image 92".

b Cited Invention

It is recognized that Cited Document 1 describes the following invention, from "First Embodiment" (see, especially underlines) described in a above. Further, "person" and "object person" have the same meaning, so that it is described uniformly in "object person".

"A method of analyzing motion information of an object person performing walking training, which information is collected by a motion information collecting circuitry 10, in a motion information processing apparatus 100, the method executing various analyses,

wherein the motion information processing apparatus 100 is an information processing apparatus such as a computer or a workstation, includes an obtaining circuitry 1401, an analyzing circuitry 1402, and a generating circuitry 1403, and is connected to the motion information collecting circuitry 10;

wherein as the motion information collecting circuitry 10, Kinect (registered trademark) is used, and the motion information collecting circuitry 10 has a distance image collecting circuitry 12 and a motion information generating circuitry 14,

wherein the motion information generating circuitry 14 acquires coordinates of each joint, which forms a skeleton of a human body, from distance image information generated by capturing a motion (gesture) of a person as a plurality of kinds of successive posture (pose) and generated by the distance image collecting circuitry 12,

wherein in a distance image, each pixel includes a three-dimensional value in which a pixel position X in a right/left direction of the distance image, a pixel position Y in an upward/downward direction of the distance image, and a distance Z between an object corresponding to the pixel and the distance image collecting circuitry 12 are associated with each other;

wherein the joints include a joint 2o corresponding to a right ankle and a joint 2s corresponding to a left ankle;

wherein the obtaining circuitry 1401 obtains distance image information and skeleton information,

wherein the analyzing circuitry 1402 calculates analysis information such as a landing point of a foot, an angle, velocity, acceleration, the number of steps, a stride, an overlapped walking distance, a step interval, and a walking rate of the object person during walking by using motion information such as the distance image information and the skeleton information obtained by the obtaining circuitry 1401; and

wherein the generating circuitry 1403 can generate track information in which a footprint of when a body shakes or loses a balance is emphasized".

(B) Regarding Cited Document 2

Cited Document 2 distributed before the priority date of the present application and cited in Reason 2 of the examiner's decision (title: "Single Limb Stance Times: A Descriptive Meta-Analysis of Data from Individuals at Least 60 Years of Age") describes the following matters. Note that suffixes indicating reference numbers are omitted.

"TESTS AND MEASURES of balance are a fundamental component of clinicians' examination of patients with a variety of diseases and disorders. Although there are numerous options for quantifying standing balance, the time an individual can stand on one lower limb (i.e., single limb stance [SLS] or unipedal balance) has been used widely, either alone or as part of a larger test battery. Wolfson et al described SLS time as 'one of the most challenging gauges of stability while standing on a narrow area of support' and averred it to be 'the most frequently used measure of balance in physical training studies involving older adults.'" (page 70, left column, lines 1 to 15)

B Comparison

The Invention and the Cited Invention are compared.

(A) "Kinect (registered trademark)" of Cited Invention corresponds to "a 3D motion sensor" of the Invention. Also, "acquires coordinates of each joint, which forms a skeleton of a human body, from distance image information generated by the distance image collecting circuitry 12" of "Kinect (registered trademark)" of Cited Invention corresponds to "capturing skeleton data of the person using a 3D motion sensor" of the Invention.

(B) The matter that in "a distance image" including "a three-dimensional value in which a pixel position X in a right/left direction of the distance image and a pixel position Y in an upward/downward direction of the distance image," "acquiring coordinates of joints" which are "a joint 2o corresponding to a right ankle and a joint 2s corresponding to a left ankle" "during walking of an object person" from "coordinates of each joint, which forms a skeleton of a human body" of Cited Invention corresponds to "tracking ankle coordinates of the person from the captured skeleton data in x plane and y plane" of the Invention.

(C) The matter of "calculating analysis information such as a landing point of a foot, an angle, velocity, acceleration, the number of steps, a stride, an overlapped walking distance, a step interval, and a walking rate of the object person during walking by using motion information such as the distance image information and the skeleton information" "acquiring coordinates of joints" which are "a joint 2o corresponding to a right ankle and a joint 2s corresponding to a left ankle" "during walking of an object person" of Cited Invention corresponds to the matter of (a step of) "deriving" "a plurality of gait parameters" "from the tracked ankle coordinates of the person" of the Invention.

(D) In Cited Invention, since "the motion information processing apparatus 100 is an information processing apparatus such as a computer or a workstation," the "method" (step) of Cited Invention corresponds to "the method comprising a processor implemented steps" of the Invention. Further, "a method of analyzing motion information of an object person" "capturing a motion (gesture) of a person as a plurality of kinds of successive posture (pose)" of Cited Invention and "a method for analyzing postural balance of a person" of the Invention are common in "a method of analyzing a posture of a person".

(E) Therefore, it can be said that the Invention and Cited Invention are identical in the point that

"A method for analyzing a posture balance of a person, the method comprising a processor implemented steps of:

capturing skeleton data of the person using a 3D motion sensor;

tracking ankle coordinates of the person from the captured skeleton data in x plane and y plane; and

deriving a plurality of gait parameters from the tracked ankle coordinates of the person,"

and different in the following points.

(Different Feature 1)

The Invention includes "removing a plurality of noises from the captured skeleton data using a noise cleaning module," whereas Cited Invention does not include such a step.

(Different Feature 2)

The Invention includes "measuring a static single limb stance (static single limb stance (SLS)) duration of the person, wherein the SLS duration is indicative of the postural balance of the person," whereas Cited Invention does not include such a step.

(Different Feature 3)

Regarding analyzing a posture of a person, the Invention "analyzes postural balance of a person," whereas Cited Invention does not analyze "balance".

(Different Feature 4)

The Invention includes a step of "estimating the postural balance of the person" on the basis of a plurality of gait parameters, whereas Cited Invention calculates analysis information such as a landing point of a foot, an angle, velocity, acceleration, the number of steps, a stride, an overlapped walking distance, a step interval, and a walking rate of the object person and generates track information in which a footprint of when a body shakes or loses a balance is emphasized, but it is not clear whether or not it "estimates the postural balance".

C Judgment

(A) Judgement on Different Features

a Regarding Different Feature 1

In (Fifth Embodiment) (see, especially underlined portions) of Cited Document 1, it is described that depth image information is obtained using the same device configuration as that of (First Embodiment), and when generating binary image from that, noise removing processing to remove a noise is performed. Here, (Fifth Embodiment) describes that "the depth image information is information to which depth information is associated instead of distance information associated with each pixel of distance image information. Each pixel position can be indicated in a distance image coordinate system similar to that of the distance image information".

Therefore, also in (First Embodiment) using distance image information, since it can be said that there is room for noise, performing noise removing processing; that is, "removing a plurality of noises from the captured skeleton data using a noise cleaning module" could have been easily conceived by a person skilled in the art.

b Regarding Different Feature 2

Since the SLS duration of Cited Document 2 is made to stand in a narrow support area, it is "static" and it can be said that standing balance, and physical balance which are described in Cited Document 2 are "postural balance". Accordingly, Cited Document 2 describes that a static single limb stance (static single limb stance (SLS)) duration of the person indicates a postural balance of a person.

Cited Invention is "a method of analyzing motion information of an object person performing walking training," and as described in [0009] of the description (1a) of Cited Document 1, since the object person is a patient with various illnesses and physical disabilities as in Cited Document 2, as an analysis of motion information of the object person, it could have been easily conceived by a person skilled in the art to add postural balance by the measurement of an SLS duration; that is, to add "measuring a static single limb stance (static single limb stance (SLS)) duration of the person" "indicating the postural balance of the person".

c Regarding Different Feature 3

As adding "measuring a static single limb stance (static single limb stance (SLS)) duration of the person" of Different Feature 2 to analyze "the postural balance," Cited Invention is a method of analyzing a postural "balance" of a person similarly to the Invention.

d Regarding Different Feature 4

As judged in (1) above, Different Feature 4 is the matters specifying the invention that falls under the addition of new matter, and is examined as follows.

"The generating circuitry 1403" of Cited Invention "generates track information in which a footprint of when a body shakes or loses a balance is emphasized," and generates that from "analysis information such as a landing point of a foot, an angle, velocity, acceleration, the number of steps, a stride, an overlapped walking distance, a step interval, and a walking rate of the object person during walking" which "the analyzing circuitry 1402" "calculates," so that it can be said that it could have been easily conceived by a person skilled in the art to "estimate a postural balance" on the basis of this analysis information.

(B) Regarding effect

The effect of the Invention cannot be said to be remarkable from the described matters of Cited Document 1 or 2.

(C) Appellant's allegation

The Appellant's allegation in the written request for appeal is that Amended Invention described in No. 2-1 (2) above is not taught, suggested, or disclosed in Cited Document 1, which is not an allegation based on the Invention, and thus cannot be accepted.

D Summary

Accordingly, the Invention could have been easily made by a person skilled in the art on the basis of Cited Invention and the matters described in Cited Document 2.

No. 4 Closing

As described above, the amendment in the written amendment dated August 13, 2018 does not meet the requirements stipulated in Article 17-2(3) of the Patent Act, and the description of the scope of claims does not meet the requirements stipulated in Article 36(6)(ii) of the Patent Act. Further, since the Appellant should not be granted a patent for the Invention under the provisions of Article 29(2) of the Patent Act, the present application should be rejected without examining inventions concerning other claims with respect to the provisions of Article 29(2) of the Patent Act.

Therefore, the appeal decision shall be made as described in the conclusion.

June 15, 2020

Chief administrative judge: MORI, Ryosuke
Administrative judge: MISAKI, Hitoshi
Administrative judge: MATSUTANI, Yohei