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Summary of Invention

Technical Problem

[0006]

However, as of current, there is no video format for 3D display suitable for 3D display of captions and menu buttons.

[0007]

Embodiments of t~~T~~he present invention ~~has been made in light of the current situation, and it is an object thereof to~~ enable providing of a video format for 3D display, suitable for 3D display of captions and menu buttons.

Solution to Problem

[0008]

~~A data structure or a recording medium according to one aspect of the present invention is a data structure or a recording medium in which is recorded data of the data structure including: image data used for 2D (2 Dimensional) display of a sub-image made up of a caption or menu button; and a table in which is described, with regard to the sub-image corresponding to the image data, offset information which is made up of an offset direction representing the direction of shift of an L image for the left eye and R image for the right eye, used for 3D display of the sub-image, and an offset value representing the amount of shift, in a manner correlated with the playing point-in-time of the~~

~~sub-image.~~In a first aspect, there is provided a data structure including: image data used for 2D (2 Dimensional) display of a sub-image made up of a caption or menu button; and a table comprising offset information in a manner correlated with the playing point-in-time of the sub-image, wherein the offset information comprises an offset direction representing the direction of shift of an L image for the left eye and R image for the right eye, used for 3D display of the sub-image, and an offset value representing the amount of shift such that the L image for the left eye and the R image for the right eye do not deviate from a screen.

[0009]

With the data structure or a recording medium in which is recorded data of the data structure according to the first aspect of the present invention, image data used for 2D (2 Dimensional) display of a sub-image made up of a caption or menu button, and a table in which is described, with regard to the sub-image corresponding to the image data, offset information which is made up of an offset direction representing the direction of shift of an L image for the left eye and R image for the right eye, used for 3D display of the sub-image, and an offset value representing the amount of shift, in a manner correlated with the playing point-in-time of the sub-image, are included

[0010]

~~A playing device according to an aspect of the present invention is a playing device which, in the event of playing data of a data structure including image data used for 2D (2 Dimensional) display of a sub-image made up of a caption or menu button, and a table in which is described, with regard to the sub-image corresponding to the image data, offset information which is made up of an offset direction representing the direction of shift of an L image for the left eye and R image for the right eye, used for 3D display of the sub-image, and an offset value representing the~~

~~amount of shift, in a manner correlated with the playing point in time of the sub-image; reads out and holds the table included in the data; reads out the image data included in the data; and in the event that the playing point in time of the image data is the playing point in time included in the table, generates and outputs image data of the L image and the R image from that image data, based on offset information described corresponding to that playing point in time.~~In a second aspect, there is provided a playing device which, in the event of playing data of a data structure including image data used for 2D (2 Dimensional) display of a sub-image made up of a caption or menu button, and a table comprising offset information in a manner correlated with the playing point-in-time of the sub-image, wherein the offset information comprises an offset direction representing the direction of shift of an L image for the left eye and R image for the right eye, used for 3D display of the sub-image, and an offset value representing the amount of shift such that the L image for the left eye and the R image for the right eye do not deviate from a screen; reads out and holds said table included in said data; reads out said image data included in said data; and in the event that the playing point-in-time of said image data is the playing point-in-time included in said table, generates and outputs image data of said L image and said R image from that image data, based on offset information described corresponding to that playing-in-time.

[0011]

~~A playing method, program, and program storing medium according to an aspect of the present invention, correspond to the above described aspect of the present invention.~~In a third aspect, there is provided a playing method, comprising the steps of a playing device, in the event of playing data of a data structure including image data used for 2D (2 Dimensional) display of a sub-image made up of a caption or menu button, and a table comprising offset information in a manner correlated with the playing point-in-time of the sub-image, wherein the offset information comprises an offset direction representing the direction of shift of an L image for the left eye and R image for the right eye, used for 3D display of the sub-image, and an offset value representing the amount of shift such that the L image for the left eye and the R image for the right eye do not deviate from a screen; reading out and holding said table included in said data; reading out said image data included in said data; and in the event that the playing point-in-time of said image data is the playing point-in-time included in said table, generating and outputting image data of said L image and said R image from that image data, based on offset information described corresponding to that playing point-in-time.

[0011a]

In a fourth aspect, there is provided a program, causing a computer which executes control to play data of a data structure including image data used for 2D (2 Dimensional) display of a sub-image made up of a caption or menu button, and a table comprising offset information in a manner correlated with the playing point-in-

time of the sub-image, wherein the offset information comprises an offset direction representing the direction of shift of an L image for the left eye and R image for the right eye, used for 3D display of the sub-image, and an offset value representing the amount of shift such that the L image for the left eye and the R image for the right eye do not deviate from a screen; to execute control processing including the steps of: reading out and holding said table included in said data; reading out said image data included in said data; and in the event that the playing point-in-time of said image data is the playing point-in-time included in said table, generating and outputting image data of said L image and said R image from that image data, based on offset information described corresponding to that playing point-in-time.

[0011b]

In a fifth aspect, there is provided a program storing medium in which is recorded a program, which causes a computer, which executes control to play data of a data structure including image data used for 2D (2 Dimensional) display of a sub-image made up of a caption or menu button, and a table comprising offset information in a manner correlated with the playing point-in-time of the sub-image, wherein the offset information comprises an offset direction representing the direction of shift of an L image for the left eye and R image for the right eye, used for 3D display of the sub-image, and an offset value representing the amount of shift such that the L image for the left eye and the R image for the right eye do not deviate from a screen; to execute control processing including the steps of: reading out and holding said table included in said data;

reading out said image data included in said data; and in the event that the playing point-in-time of said image data is the point-in-time included in said table, generating and outputting image data of said L image and said R image from that image data, based on offset information described corresponding to that point-in-time.

[0011c]

In a sixth aspect, there is provided a recording method for causing a recording apparatus to execute the steps of: recording image data, which is used for 2D (2 Dimensional) display of a sub-image configured by captions or a menu button, in a recording medium; setting offset information configured by an offset direction and an offset value such that an L image for a left eye and an R image for a right eye do not deviate from a screen, the offset direction and the offset direction representing a deviation direction and a deviation amount, respectively, of the L image and the R image, which are used for 3D display of the sub-image, with respect to the sub-image corresponding to the image data; and recording in the recording medium a table in which the offset information is associated with reproduction time of the sub image.

[0012]

With the playing device, playing method, program, and program storing medium, according to the above aspects~~an aspect~~ of the present invention, data of a data structure including image data used for 2D (2 Dimensional) display of a sub-image made up of a caption or menu button, and a table in which is described, with regard to the sub-image corresponding to the image data, offset information which is made up of an offset direction representing the direction of shift of an L image for the left eye and R image for the right eye, used for 3D display of the sub-image, and an offset value representing the amount of shift, in a manner correlated with the playing

point-in-time of the sub-image, is played as follows. That is to say, the table included in the data is read out and held. Also, the image data included in the data is read out. In the event that the playing point-in-time of the image data is the playing point-in-time included in the table, image data of the L image and the R image from that image data is generated and output, based on offset information described corresponding to that playing point-in-time.

Advantageous Effects of Invention

[0013]

According to embodiments of the present invention, 3D display of captions and menu buttons can be performed. Also, a video format for 3D display, suitable for 3D display of captions and menu buttons, can be provided.

Brief Description of Drawings

[0014]

[Fig. 1] Fig. 1 is a diagram illustrating a configuration example of a first embodiment of a disc to which the present invention has been applied.

[Fig. 2] Fig. 2 is a diagram illustrating a detailed configuration example of an index file.

[Fig. 3] Fig. 3 is a diagram conceptually illustrating a database of offset information.

[Fig. 4] Fig. 4 is a diagram illustrating a description example of a playlist file.