

DESCRIPTION

GAME SYSTEM, PROGRAM AND INFORMATION STORAGE MEDIUM

Technical Field

[0001]

The present invention relates to a game system, a program and an information storage medium.

[0002]

Background Art

In recent years, game character items each created by using an animated character or a character of a professional sport player, for example, increasingly become popular, and collecting cards each with a picture of a character, for example, (which are so-called trading cards) and collecting figures created to imitate a character are supported by a wide range of ages. The game system disclosed in Unexamined Patent Application Publication No. 2006-95180 or Unexamined Patent Application Publication No. 2002-153675 is known in which a storage medium is mounted to a character item such as a trading card and a figure and information on the character is read from the storage medium to play a game.

Disclosure of Invention

[0003]

However, the game system disclosed in Unexamined Patent Application Publication No. 2006-95180 requires, in order to

play a game, the purchase of a character item to which a storage medium is to be mounted and additional insertion of money or a coin worth of the value of money to a game apparatus. Therefore, it is difficult to motivate a person who is strongly interested in the collection of character items to play a game, and it is difficult to motivate a person who is strongly interested in playing games to purchase character items. For that reason, the promotion of purchase of character items and the enhancement of operations of game systems are being strongly demanded.

[0004]

In a game system disclosed in Unexamined Patent Application Publication No. 2002-153675, a three-dimensional article that is equivalent to a character item is pre-mounted to a memory, and the data defining a playable time and/or the possible number of plays of a game, for example, is/are pre-stored in the memory. However, beyond the tolerance of the playable time or the possible number of plays of a game, for example, the fact is written into the memory. Therefore, by removing the three-dimensional article from the game system during a game, the same three-dimensional article can be reused for the game although it is really beyond the tolerance, which is a wrongful act that may not be prevented.

[0005]

The conventional game system has a problem that a character item of a game is of no utility value after the character information is read from the character item. In the conventional game system, in order to prompt a player to perform an operation in a game, a separate game controller such as a lever and a button must be deployed in addition to a device that reads data from a character item. Therefore, there is concern that the degree of freedom of the apparatus design may be reduced.

[0006]

The present invention was made in view of the situations, and it is an object of the present invention to provide a game system, program and information storage medium that can synergistically seek the promotion of the purchase of character items and the promotion of the use of games and secure the charging for a game.

[0007]

(1) The present invention relates to a game system including a reader/writer unit that performs the transmission/reception of data by radio with an RFID tag mounted to a character item and performs a data read operation and write operation on a storage medium included in the RFID tag, and a game processing unit that performs the transmission/reception of data to/from the reader/writer unit, obtains the data, which is read from the RFID tag,

from the reader/writer unit, and performs game processing animating a game character associated with the character item on the basis of the obtained data, wherein the storage medium included in the RFID tag stores credit data associated with the number of plays left for a game and a game parameter to be used for the game processing by the game processing unit, and the game processing unit obtains the credit data from the RFID tag through the reader/writer unit, performs update processing on the credit data stored in the storage medium included in the RFID tag through the reader/writer unit on the basis of the satisfaction of a given condition, and starts the game processing after the update processing on the credit data.

[0008]

The present invention further relates to a program for a game system having a reader/writer unit, the program causing a computer in the game system to function as the game processing unit. The present invention further relates to a computer-readable information storage medium that stores the program.

[0009]

The "character item" may correspond to a card with a picture of a character, a figure created to imitate a character or the like.

[0010]

The "credit data" may be a value associated with the number of plays left for a game and correspond to the charge for one or plural games, which may be the value indicating the amount of money (such as 100 (yen), and 200 (yen)) or the value of the number of plays left for a game itself (such as 1 (play) and 10 (plays)).

[0011]

The "game parameter" may correspond to a parameter defining the type or attribute of a game character associated with a character item, a parameter defining a status (such as strength, striking power, defensive strength and quickness) of a game character or the like.

[0012]

According to the present invention, the storage medium included in the RFID tag stores credit data associated with the number of plays left for a game and a game parameter to be used for the game processing by the game processing unit. Therefore, the purchase itself of a character item to which the RFID tag is mounted can be handled as a charge for a game. Because this can motivate a person who wishes to play a game to purchase a character item, the promotion of the purchase of character items can be sought. Furthermore, because it can also allow a person who wishes to purchase character items to play a game only by purchasing a character item, the promotion of the use of a game can be

sought.

[0013]

According to the present invention, the update processing on the credit data is performed before the game processing is started by using the game parameter stored in the storage medium included in the RFID tag. Therefore, the charging for a game can be securely performed when the game is played.

[0014]

(2) In the game system, program and information storage medium of the present invention, the game processing unit may obtain information depending on the positional relationship between the reader/writer unit and the RFID tag mounted to the character item from the reader/writer unit as input information by a player and perform the game processing.

[0015]

Because this eliminates the necessity for a special input device (such as a lever and a button) for playing a game, the degree of freedom in apparatus design of the game system can be enhanced. Furthermore, providing an unprecedented input interface can attract player's attention.

[0016]

(3) In the game system, program and information storage medium of the present invention, the reader/writer unit may

have a plurality of read positions for performing the transmission/reception of data to/from the RFID tag mounted to the character item and performing a data read operation, and the game processing unit may obtain the difference in read position where the transmission/reception of data is performed with the RFID tag in the reader/writer unit as input information by a player and perform the game processing.

[0017]

This allows animating a game character based on the movement a character item by a player, which allows a player to perform intuitive input operations. Therefore, the input interface can be enhanced.

[0018]

(4) In the game system, program and information storage medium of the present invention, the reader/writer unit may have at least one reader/writer that can perform both of a data read operation and write operation on a storage medium included in the RFID tag mounted to the character item and at least one reader that can perform the data read operation only. The reader/writer and the reader may be provided so as to be capable of performing the transmission/reception of data to/from the RFID tag in separate communication ranges. The game processing unit may obtain at least one of the fact that the RFID tag performs a reciprocating motion between

the inside and outside of the communication range of the reader/writer or the reader within a given period of time and a period of time required by the RFID tag for performing a reciprocating motion between the inside and outside of the communication range of the reader/writer or the reader as input information by a player and perform the game processing.

[0019]

The input required for the game processing can be performed by a player by causing a character figure to perform a reciprocating motion between the inside of the communication range and the outside of the communication range of the reader/writer or reader, and the fact that the reciprocating motion is performed within a given period of time or the period required for the reciprocating motion can be handled as the input information by a player. Therefore, without an input device that has been adopted in a conventional game system, such as a button and a lever, a wide variety of input information by a player can be handled, which can enhance the input interface.

[0020]

(5) In the game system, program and information storage medium of the present invention, the game processing unit may update the game parameter stored in the storage medium included in the RFID tag mounted to the character item

through the reader/writer unit on the basis of the history of the input information by a player.

[0021]

Because this allows updating a game parameter every time the game is played, the player can be motivated to use the game system again next time. Therefore, the use of the game can be promoted.

[0022]

(6) The game system of the present invention may further include a sales unit that receives the insertion of paper currency, a coin or electronic money and provides the character item. Notably, the "coin" includes not only money in circulation on the market but also a medal to which a value corresponding to money is given, for example.

[0023]

Because this allows purchasing a character item for performing a game in the game system, both of the promotion of the purchase of a character item and the promotion of the use of a game can be synergistically sought.

[0024]

(7) The present invention further relates to a program for a computer having, as an input/output interface, a reader/writer unit that performs the transmission/reception of data by radio with an RFID tag mounted to a character item and performs a data read operation and write operation

on a storage medium included in the RFID tag, the reader/writer unit being employed in the game system according to any one of (1) to (6), wherein the storage medium included in the RFID tag stores a value subtracted by the game system as credit data before a game is started, and the computer is caused to function as a credit update processing unit that performs credit update processing adding a given value to the credit data stored in the storage medium included in the RFID tag through the reader/writer unit in the computer. The present invention further relates to a computer-readable information storage medium that stores the program.

[0025]

According to the present invention, the value of credit data is subtracted every play of a game. Alternatively, a given value may be added to the credit data. Therefore, the reuse of a character item is allowed, from which the contribution to the resource saving can be expected.

Brief Description of Drawings

[0026]

[Fig. 1] Fig. 1 is an external view of a game system of an embodiment.

[Fig. 2A] Fig. 2A is an explanatory diagram for a character figure used in the game system of the embodiment.

[Fig. 2B] Fig. 2B is an explanatory diagram for a character figure used in the game system of the embodiment.

[Fig. 3] Fig. 3 is a hardware configuration diagram for the game system of the embodiment.

[Fig. 4] Fig. 4 is a functional block diagram for the game system of the embodiment.

[Fig. 5] Fig. 5 is a flowchart illustrating a control method for the game system of the embodiment.

[Fig. 6A] Fig. 6A is an explanatory diagram for an input form by a player in the game system of the embodiment.

[Fig. 6B] Fig. 6B is an explanatory diagram for the input form by a player in the game system of the embodiment.

[Fig. 6C] Fig. 6C is an explanatory diagram for the input form by a player in the game system of the embodiment.

[Fig. 7] Fig. 7 is a diagram showing a display screen on the game system of the embodiment.

[Fig. 8A] Fig. 8A is a diagram showing an example of an input determination table that implements the control method of the embodiment.

[Fig. 8B] Fig. 8B is a diagram showing an example of the input determination table that implements the control method of the embodiment.

[Fig. 9] Fig. 9 is a diagram showing a display screen on the game system of the embodiment.

[Fig. 10] Fig. 10 is a diagram showing an application

example of the embodiment.

[Fig. 11] Fig. 11 is a diagram showing an application example of the embodiment.

Best Mode for Carrying Out the Invention

[0027]

An embodiment of the present invention will be described below. Notably, the embodiment which will be described below does not invalidly limit the spirit of the present invention disclosed in CLAIMS. All components described in the embodiment are not typically necessary constituent features of the present invention.

[0028]

1. Configuration

Fig. 1 is an external view of a game system of an embodiment of the present invention.

[0029]

A game system of this embodiment has a configuration integrally including, as shown in Fig. 1, a sales unit that provides a character figure (which is an example of the character item) in a capsule-type container and a game unit for playing a game by using the character figure purchased from the sales unit in a body cabinet CAB. This allows purchasing a character figure required for playing a game in a game system, which can synergistically promote both of the purchase of a character figure and the use of a game.

Another embodiment of the present invention may be implemented by a form in which the sales unit and the game unit are provided separately, without being limited to the integration of the sales unit and the game unit as shown in Fig. 1. For example, one of the sales unit and the game unit may be provided in an upper part while the other may be provided in a lower part. One may be placed on the left hand side while the other may be placed on the right hand side. In the configuration shown in Fig. 1, the game unit may be removable from the sales unit.

[0030]

In the sales unit, if a player inserts a coin (such as money in circulation on the market and a medal to which a value corresponding to money is given) to a coin insertion slot MI, a rotational operation on a rotational handle RHD is allowed. Rotating the rotational handle RHD clockwise provides a capsule-type container CP to a player from a container storage unit CS to an output port CO. The sales unit is configured such that pressing a return button RBT down can return the coin inserted to the coin insertion slot to a coin return opening. Notably, the configuration is also applicable that the insertion of paper currency and/or electronic money is acceptable instead of a coin. The sales unit may be configured such that it can accept the insertion of a coin, for example, and can electrically provide the

capsule-type container CP to a player in accordance with a switch input, for example.

[0031]

In the game system of this embodiment, as shown in Fig. 2A, a character figure CF contained in the capsule-type container CP is provided from the sales unit to a player. A player can take out the character figure CF from the container CP by separating a hemisphere CPA and a hemisphere CPB constructing the container CP.

[0032]

According to the embodiment, as shown in Fig. 2B, the character figure CF is a figure forming a robot, and the figure body BD, which is a resin mold, has a projection PJ at the bottom. The projection PJ of the figure body BD is inserted to a hole HL of a pedestal PD, which is a pillar-shaped resin mold, and is fixed thereto with an adhesive, for example. The pedestal PD includes a handle unit HD that opens on the surface side of the opposite side of the surface having the hole HL and a base unit BP that is fixed to block the opening of the handle unit HD. The base unit BP has a tag storage unit BS that stores an RFID tag TG, which is an IC chip having the integration of a memory (storage medium), an antenna and a logic circuit. The RFID tag TG has a function of starting the logic circuit connecting to the antenna and performs operational

processing on data within the memory by receiving radio waves (or electromagnetic waves), which are transmitted by radio from a reader/writer unit RWU with the antenna.

Notably, the configuration of the character figure is not limited to those described above but may vary.

[0033]

According to this embodiment, the RFID tag TG contained in the pedestal PD for a character figure CF stores data such as ID authentication data for individually identifying a character figure CF, credit data corresponding to the number of plays left for a game and game parameters that define the type and status (such as a strength, a striking power, a defensive strength and a quickness) of a game character. Particularly in this embodiment, character figures CF formed to imitate the same kind of character but for game characters having different statuses, which are read from the RFID tag TG, can be provided from the sales unit to a player. In other words, even a character figure CF externally formed to imitate the same kind of character may provide game characters with different statuses, which are read from the RFID tag TG. In this case, scarcity values are given to the character figures CF formed to imitate the same kind of character with the difference in status. This can motivate a player to collect character figures CF. According to this embodiment, even when, as

described above, the statuses of game characters read from the same kind of character figures CF are different, the character figures CF appear to be indistinguishable. This provides the new application of the character figures CF in which the game unit is used to check the status can be provided.

[0034]

The game unit is provided on the front side of the container storage unit CS in the body cabinet CAB and includes a liquid crystal display LCD, which is a display screen for a game, a reader/writer unit RWU for performing the transmission/reception of data to/from a character figure by radio, a speaker unit SO that outputs a sound effect in a game and a system board (game processing unit) that creates a game image to be shown on the liquid crystal display LCD on the basis of obtained data from the reader/writer unit RWU. In the game system of this embodiment, three character figures can be changed to use in one play of a game, the body cabinet CAB has figure storage units FP1 and FP2 on the left and right sides of the reader/writer unit RWU for storing character figures which are not in use. Notably, the speaker body and the system board are internally provided in the body cabinet CAB and are not shown.

[0035]

The game unit has a hardware configuration as shown in Fig. 3. The system board is an electronic circuit substrate including processors such as a CPU, a GPU and a sound processor and memories such as a ROM, a RAM and a VRAM. The CPU is a processor that authenticates the RFID tag mounted to a character figure, determines input data required for developing a game, controls the display of an object such as a game character or performs operational processing by using a game parameter. The GPU is a processor that performs processing of creating a game image to be displayed on the liquid crystal display on the basis of the processing result by the CPU. The game image created by the GPU is output to the liquid crystal display in a video signal (RGB signal) form that defines pixel color information. The sound processor is a processor that performs processing of reproducing a sound effect in a game, which is to be output from the speaker. The sound effect in a game is output to the speaker in an audio signal form. The processors perform operational processing by using memories (such as a RAM and a VRAM) connected thereto through a bus interface.

[0036]

In the game unit, the reader/writer unit, which is an input/output interface, includes a reader/writer RW that can read data from the RFID tag mounted to a character figure and write data to the RFID tag and a left reader R1, center

reader R2 and a right reader R3 that can only read data from the RFID tag mounted to a character figure (refer to Fig. 1). In other words, the reader/writer unit has the reader/writer RW and the left reader R1, center reader R2 and right reader R3 as read positions for performing the transmission/reception of data to/from the RFID tag mounted to character figure and performing data read operations. In this configuration, a player may place a character figure on the reader/writer RW to check the status of the game character associated with a character figure or to pay for the credit required for playing a game. A player may place a character figure on the left reader R1, center reader R2 or right reader R3 to perform an input operation required for developing a game.

[0037]

Notably, having described that, in the game system of this embodiment, the reader/writer unit RWU is composed of the reader/writer RW, left reader R1, center reader R2, and right reader R3, the writer function may be provided in any one reader of the left reader R1, center reader R2 and right reader R3 without additionally providing the reader/writer RW.

[0038]

Fig. 4 shows an example of the functional block diagram for the game system of this embodiment. Notably, the game

system of this embodiment is not required to include all of the shown components (and units), and a part of them may be omitted.

[0039]

A reader/writer unit 160 is a unit for performing the transmission/reception of data to/from an RFID tag 162 by radio and performing a data read operation and data write operation on a memory (not shown) included in the RFID tag 162. In the embodiment, the reader/writer unit 160 also functions as a player input interface for a game. By moving a character figure to change the positional relationship between the reader/writer unit 160 and the RFID tag 162 by a player, input information can be obtained for game processing.

[0040]

A storage unit 170 functions as a work area for a processing unit 100, and the function can be implemented by hardware such as a RAM and a VRAM. An information storage medium 180 (which is a computer-readable medium) stores a program and/or data, for example. The function can be implemented by hardware such as an optical disk (such as a CD and a DVD), a magneto-optical disk (MO), a magnetic disk, a hard disk, a magnetic tape and a memory (ROM). The processing unit 100 performs various kinds of processing of the embodiment on the basis of programs (or data) stored in

the information storage medium 180 or data read from the RFID tag 162 through the reader/writer unit 160. In other words, the information storage medium 180 stores programs causing a computer to function as the components of the embodiment (which is a program causing a computer to perform the processing by the components). The storage medium in the RFID tag 162 stores auxiliary data (added data) for programs causing a computer to function as the components of the embodiment, such as ID authentication data for individually identifying an RFID tag, credit data corresponding to the charge for the game system and/or the number of plays left for a game, game parameters that define the status of a game character, personal data of a player and saved data on a game. Notably, it may be configured such that other portable information storage media than the RFID tag 160 can be used. Data can be read from a memory card, a magnetic card, an IC card or a bar-code printed card, for example. The alternatives for the RFID tag 160 may include a portable game system including a radio communication function and a portable information terminal such as a cellular phone.

[0041]

A display 190 outputs an image created by the processing unit 100 in the game system of this embodiment and adopts an LCD (liquid crystal display) in this

embodiment. The display 190 may be implemented by hardware such as a CRT display, an OLED (organic electroluminescence display), a PDP (plasma display panel), a touch panel type display and an HMD (head mount display). A speaker 192 outputs a sound created by this embodiment. The function can be implemented by hardware such as a speaker and a headphone.

[0042]

Notably, a program (or data) causing a computer to function as the components of this embodiment may be distributed from an information storage medium of a host apparatus (or game server) to the information storage medium 180 (or the storage unit 170) over a network. The use of an information storage medium by a game server (or host apparatus) can be included in the scope of the present invention.

[0043]

The processing unit 100 (or a processor) performs processing such as game operation processing, image creation processing and sound creation processing on the basis of input data from the reader/writer unit 160, a program expanded from the information storage medium 180 to the storage unit 170 or the like. The processing unit 100 performs processing by using the storage unit 170 as a work area. The function of the processing unit 100 can be

implemented by hardware such as a processor (such as a CPU, a GPU and a DSP) and an ASIC (such as gate array) and by a program (or a game program).

[0044]

The processing unit 100 further performs game processing such as processing of starting a game when a game starting condition is satisfied, processing of developing a game, processing of arranging an object such as a game character, processing of animating and displaying an object, processing of computing a game result, processing of ending a game if a game ending condition is satisfied and credit processing for collecting a charge in the game system.

[0045]

The processing unit 100 further performs game processing of determining the type of input information by a player on the basis of input information from the reader/writer unit 160 and/or a program, for example, and evaluating the input information by a player. The processing unit 100 further performs game processing of performing an operation for determining the position and operation of a game character within a game space on the basis of the result of the evaluation on the type of input information by a player and/or input information by a player and creating an image displaying a state that a game character moves or operates within the game space.

[0046]

The processing unit 100 includes a credit processing section 110, a character registering/changing section 111, an input processing section 112, an evaluation processing section 114, a display control section 116, a parameter updating section 118, a rendering processing section 120 and a sound processing section 130. Notably, a part of them can be omitted.

[0047]

The credit processing section 110 obtains credit data from the RFID tag 162 through the reader/writer unit 160. The credit data stored in a memory internally included in the RFID tag 162 is a value associated with the number of plays left for a game and may be the value (such as 100(yen) and 200(yen)) indicating the amount of money corresponding to the charge for one or more plays of a game or may be the value itself (such as 1 (play) and 10 (plays)) of the number of plays left for a game. The credit processing section 110 performs update processing on credit data stored in a memory within the RFID tag 162 through the reader/writer unit 160 on the basis of the fact that a player has picked up a character figure to which RFID tag 162 is mounted and has moved it in a predetermined mode to obtain predetermined input information through the reader/writer unit 160 (which is the satisfaction of a given condition).

[0048]

In the game system of this embodiment, the processing unit 100 determines that a condition for starting a game has been satisfied on the basis of the fact that update processing on credit data has completed in the credit processing section 110 and controls such that game processing for causing game characters to fight can be started.

[0049]

The character registering/changing section 111 before a player plays a game performs processing for registering a game character to use in a game and/or changing the game characters to use in a game.

[0050]

In the game system of this embodiment, after the completion of the update processing on credit data, the game character associated with a character figure to which the RFID tag 162 storing the updated credit data is mounted is registered as a character to use in a game. Furthermore, in the game system of this embodiment, the additional registration of two game characters is allowed. Therefore, when a player places a character figure on the reader/writer unit 160, a game parameter on a game character wished to register additionally is read. Then, if a player picks up the character figure and moves it in a predetermined mode

and thus predetermined input information is obtained through the reader/writer unit 160, the game character is additionally registered with a character table within the storage unit 170.

[0051]

In the game system of this embodiment, if a predetermined condition is satisfied during the play of a game, control is performed such that the game character to use can be changed. If, under the state, a player changes the character figures, the ID authentication data is obtained from the RFID tag mounted to the character figure 162. Then, before the game is started, whether it is a character figure corresponding to the game character registered with the character table in the storage unit 170 or not is checked. If so, the game characters are changed. In other words, a game character before the change is deleted from an object list having candidates for the objects to construct a game image, and a game character after the change is newly added to the object list.

[0052]

The input processing section 112 performs processing of determining the obtained type of input information on a player through the reader/writer unit. In the game system of this embodiment, the reader/writer unit 160 performs communication for ID authentication with the RFID tag 162

every predetermined unit period (such as approximately 1 frame (1/60 of a second) to several frames) and determines the type of input information by a player by comparing the result of the communication performed periodically and the input determination table stored in the storage unit 170. The input determination table has settings of the information depending on the positional relationship between the reader/writer unit 160 and the RFID tag 162 mounted to a character item as the input information by a player. For example, different types of input information are set in accordance with the differences in reader that communicates with the RFID tag 162, the fact that the RFID tag 162 performs a reciprocating motion between the inside and outside of the communication range within a given period of time of one reader and/or the period of time required for the RFID tag 162 to perform a reciprocating motion between the inside and outside of the communication range of one reader, for example. Because this can eliminate the necessity for a special input device (such as a lever and a button) for playing a game, the degree of freedom in apparatus design of the game system can be enhanced. Furthermore, providing an unprecedented input interface can attract player's attention. Notably, input information according to the number of reciprocating motions between the inside and outside of the communication range of one reader

by the RFID tag 162 within a give period of time may be set on the input determination table. This allows the acceptance of a wide variety of input information even when the number of readers is reduced for space saving.

[0053]

The evaluation processing section 114 performs evaluation processing of evaluating the result of offence and defense in the fight between game characters on the basis of the determination result on the type of input information by the input processing section 112, game parameters defining statuses (such as strengths, striking powers, defensive strengths and quicknesses) for the game characters and/or the times when input information is obtained, for example, and updating the statuses (such as a strength) of the game characters.

[0054]

The display control unit 116 performs the display control over an object to be displayed and be output on the display 190. More specifically, the display control unit 116 performs display control such as causing an object (such as a game character, a background, a target, a car, a ball, an item, a building, a tree, a pillar, a wall and a map) to occur, designating the display position of an object and causing an object to vanish. In other words, the display control unit 116 performs display control such as

registering an occurring object with an object list, transferring the object list to the rendering processing section 120, for example, and deleting the object, which has vanished, from the object list.

[0055]

The display control section 116 further performs control for displaying an image of a caused movement or operation on the display 190 if input information by a player, for example, causes the movement or an operation of a game character.

[0056]

The display control section 116 further performs animation processing of moving or operating a game character.

[0057]

The animation processing may include processing of moving a game character (which is an object defined by two-dimensional data or three-dimensional data) in a game field (which is a two-dimensional or three-dimensional game space). More specifically, the display control unit 116 performs animation processing of moving an object on the basis of input data input by a player through the reader/writer unit 160, a program (moving algorithm) and/or data. Still more specifically, the display control unit 116 performs processing of sequentially obtaining the movement information (which is the position, rotation angle, speed or

acceleration) of an object for each 1 frame (or 1/60 of a second). Notably, the frame is a unit of the time for performing processing of controlling the movement or operation of an object.

[0058]

The animation processing may include processing for operating an object. In other words, on the basis of input data input by player through the reader/writer unit 160, a program (or operation algorithm) or data (or motion data), the display control unit 116 performs the animation processing of causing an object to operate (or produce motion). Still more specifically, the display control unit 116 performs processing of sequentially obtaining operation information (or the position, rotation angle or form of each part) of an object for each 1 frame (or 1/60 of a second).

[0059]

) The parameter updating section 118 performs processing of updating a game parameter stored in a memory in the RFID tag 160 mounted to a character figure on the basis of the history of input information by a player through the reader/writer unit 160. In the game system of this embodiment, the history of input information by a player in a game is always written to the storage unit 170 by the processing unit 100, and game parameters such as data on the attribute and/or skill of a game character and data on the

status (such as strength, striking power, defensive strength and quickness) of a game character on the basis of the history of input information by a player as of the end of a game. Particularly in this embodiment, the status of a game character can be updated by using the concept of levels. More specifically, the width of increase for raising the level of the status depends on the current level of a game character. In this embodiment, the parameter updating section 118 performs level-up update processing for raising the level of the status if a game character of a player wins a fight and the game ends.

[0060]

The rendering processing section 120 performs rendering processing on the basis of the result of various processing (or game processing) performed by the processing unit 100, thus creates an image, and outputs it to the display 190. In this case, the image created by the rendering processing section 120 may be a so-called two-dimensional image or three-dimensional image. In order to create a three-dimensional image, geometry processing is first performed including coordinate transformation (such as world coordinate transformation and camera coordinate transformation), clipping processing or perspective transformation, for example, and, on the basis of the processing result, rendering data is created (such as the

position coordinates, texture coordinates, color data, normal vector or α -value of the vertex of a primitive). Then, on the basis of the rendering data (primitive data), an object (one or more primitives) after perspective transformation (or after geometry processing) is rendered in a rendering buffer (which is a buffer that can store image information in pixels, such as a frame buffer and middle buffer: a VRAM). This creates an image viewed from a virtual camera (or a given eyepoint) within a game space.

[0061]

The sound processing section 130 performs sound processing on the basis of the result of various processing performed by the processing unit 100, creates a game sound such as a BGM, a sound effect and voice and outputs it to the speaker 192.

[0062]

Notably, the game system of this embodiment may be a system specially for a single player mode under which only one player can play or may be a system having not only the single player mode but also a multi-player mode under which multiple players can play. In order for multiple players to play, game images and game sounds to be provided to the multiple players may be created by using one terminal or may be created by using multiple terminals (such as a game system and a cellular phone) connected thereto over a

network (such as a transmission line and a communication line).

[0063]

2. Control Method of the Embodiment

With reference to Figs. 5 to 9, a control method for the game system of the embodiment will be described below.

[0064]

Fig. 5 is a flowchart showing an example of the control method for the game system of this embodiment.

[0065]

First of all, in the game system of the embodiment, the reader/writer unit RWU receives ID authentication from the RFID tag mounted to a character figure (step S10). As shown in Fig. 6, if a player places a character figure CF on the reader/writer RW in the reader/writer unit RWU, the ID authentication data is obtained from the RFID tag mounted to the character figure CF. Then, whether it is a valid ID or not is determined (step S11). If it is determined that it is a valid ID as a result of the determination, credit data and a game parameter therein are obtained. Then, whether they can be used for a game or not is determined (step S13). In this embodiment, a new character figure purchased from the sales unit stores, as the credit data, the value corresponding to one play as the number of plays left for a game in a memory (or a storage medium) in the RFID tag. If

the number of plays left for a game is one (1), it is determined that the player has credit. If the value has already been subtracted to zero as a result of plays of the game, it is determined that the player does not have credit.

[0066]

If it is determined that the player has credit from the credit data obtained from the ID-authenticated RFID tag (step S13), that is, if the player places a character figure CF newly purchased from the sales unit on the reader/writer RW, a status check screen as shown in Fig. 7 is displayed on the liquid crystal display (step S14). Then, control is performed so as to obtain a state that can accept the start of the game. The status check screen displays a status such as the type, strength, striking power, defensive strength, quickness and level of a game character on the basis of the obtained game parameters from the RFID tag and displays the possible number of plays of a game (which is synonymous with the number of plays left for a game) on the basis of the obtained credit data from the RFID tag. The status check screen further displays a message that prompts to perform an input operation, which triggers the start of a game, and notifies the mode of the input operation to the player.

[0067]

In the game system of this embodiment, the reader/writer unit for reading data from the RFID tag

mounted to a character figure or writing data to the RFID tag is used as an input interface for obtaining input information by a player in a game. More specifically, the reader/writer RW, left reader R1, center reader R2 and right reader R3 composing the reader/writer unit RWU have independent communication ranges CA, as shown in Fig. 6B. The fact that a character figure CF (more strictly speaking, the RFID tag mounted to the character figure CF) performs a reciprocating motion inside and outside of the communication range CA within a predetermined period of time can be obtained as the input information by player. Notably, the reciprocating motion by a character figure CF is determined on the basis of the communicability with an RFID tag, which is performed almost periodically for the ID authentication. [0068]

In this embodiment, a game can be started by performing a tap operation performed by a player, which includes rearranging the character figure CF placed on the reader/writer RW to the center reader R2 and lifting and dropping the character figure CF from and to the center reader R2 as shown in Fig. 6B. On the system board side, when the status check screen is being displayed on the liquid crystal display, the input information by a player is processed by using the input determination table as shown in Fig. 8A. In order to allow a player to perform selection

input, choices and the readers are associated with each other in advance. As shown in Fig. 6C, if a player moves a character figure CF to change the reader to place the character figure CF, it is determined that the choice associated with the reader on which the character figure is currently placed is selected from the multiple choices. In order to prompt a player to perform determination input, it is determined that the tap operation has been performed on the basis of the fact that a character figure (more strictly speaking, the RFID tag mounted to the character figure) performs a reciprocating motion between the inside and outside of the communication range of one reader as shown in Fig. 6B within a predetermined period of time (such as within one second, which is synonymous with within 60 frames).

[0069]

Also if it is determined that the player does not have credit from the credit data obtained from the RFID tag, that is, if the character figure CF placed on the reader/writer RW, as shown in Fig. 6A, has been already used and the possible number of plays of a game is 0, the status check screen is displayed (step S15). However, in the case in step S15, the status check screen only displays statuses such as the type, strength, striking power, defensive strength, quickness and level of a game character and does

not display a message that prompts to perform an input operation, which triggers the start of a game, and notifies the mode of the input operation to the player.

[0070]

If the newly purchased character figure CF placed within the communication range of reader/writer RW, as shown in Fig. 6A, is rearranged to the communication range of the center reader R2, as shown in Fig. 6B, and the tap input is performed by causing the rearranged character figure CF to perform a reciprocating motion between the inside and outside of the communication range of the center reader R2 (Y in step S16), it is determined that the game starting condition is satisfied. Then, the credit data stored in a memory in the RFID tag mounted to the character figure CF is updated (step S17). In other words, the value stored as the number of plays left for a game is subtracted, and the subtraction result is written to the memory in the RFID tag to update the credit data. If the credit data is updated, processing of registering a game character associated with a character figure CF as a character to use in a game is performed, and the additional registration of game characters is accepted within a limitation of game characters associated with two character figures (step S18). The additional registration of game characters is performed by placing a character figure CF corresponding to the game

character wished to use on the reader/writer RW to have the game parameters read from the RFID tag mounted to the character figure CF by the reader/writer RW.

[0071]

If the registration of a game character completes, the game character registered in step S18 is moved or operated by picking up and moving the character figure to the reader/writer unit RWU, as shown in Fig. 6B and Fig. 6C. Thus, the game processing starts in which the game characters fight with each other (step S19). At that time, a game screen as shown in Fig. 9 is displayed on the liquid crystal display. The game screen displays a player's game character PRC (robot A) to be operated by a player and an enemy game character ERC (robot B) which is an opponent and may display a strength gauge HPG visually indicating the current strength of each game character. The game screen may display guidance for registered game characters in addition to those described above.

[0072]

In this embodiment, a method is adopted that determines an enemy game character ERC, which is an opponent, with reference to the level (which is a level value increased every time a player wins a fight) set for the player's game character RPC to be operated by the player. More specifically, it can be implemented by storing data on the

enemy game character ERC in the information storage medium 180 shown in Fig. 4, for example, in connection with the level of the player's game character RPC and, when a player's game character RPC is registered, reading data on a preferably enemy game character ERC from the information storage medium 180 to the storage unit 170, which is a work area, with reference to the level of the registered player's game character RPC. This can prevent a one-sided dominance relationship between a player's game character RPC and an enemy game character ERC and can provide heated game development even when the player's game character RPC is set to any one of the levels.

[0073]

In this embodiment, a player's game character PRC can move among a center position CP, a left position LP and a right position RP in accordance with the instruction to move by a player. Because the positions and the readers are associated with each other, a player's game character RPC is displayed at the center position CP if the character figure CF is placed on the center reader R2 as shown in Fig. 6C. If the character figure CF is moved to the left reader R1 or the right reader R3, the game screen displays the state that the player's game character PRC moves to the left position LP or the right position RP on the reader/writer unit RWU with the movement of the character figure CF. An enemy game

character ERC, which is an opponent of the player's game character PRC, also moves among the left position LP, center position CP and right position RP in accordance with a predetermined algorithm. Furthermore, in this embodiment, game processing may be performed in which a player's game character PRC and an enemy game character ERC emit beams, for example, to each other to play a shooting game. If the beam emitted by one game character hits the other game character, processing of subtracting the strength of the game character hit by the beam is performed. When the strength of one of the game characters finally reaches zero (0), the fight ends.

[0074]

In the game system of this embodiment, while the game processing is being performed, the input information by a player is processed by using an input determination table as shown in Fig. 8B. For example, as shown in Fig. 6C, the movement of a game character can be instructed by changing the position of the reader on which a character figure CF is placed. The tap input that lifts and drop a character figure CF from and to the reader on which the character figure CF is currently placed, as shown in Fig. 6B, can instruct a normal attack (such as an attack of emitting a beam from a game character). In the tap input, a character figure may be moved to keep outside of the communication

range of the reader for three seconds and then drop the character figure to the inside of the communication range of the reader. This can instruct a ki-attack (such as an attack emitting a stronger beam than that of the normal attack from a game character). Performing consecutive two tap inputs each lifting and dropping a character figure CF to and from the reader on which the character figure CF is currently placed, as shown in Fig. 6B, can instruct an operation defending against a beam attack from the enemy game character ERC. In this case, if the instruction to defend a player's game character PRC completes before the beam attack from the enemy game character ERC hits it, the damage caused by the beam attack to the player's character PRC can be reduced. The change of game characters is accepted if a predetermined condition is satisfied in a game, for example, if the strength of the game character to be operated currently in the game is low. The change of game characters can be instructed by replacing the character figure by a character figure which has been additionally registered in advance. If a predetermined condition is satisfied in a game, for example, in a case where the strength of an opponent game character is low, a double-attack is allowed in which two character figures are used simultaneously as a special attack. The double attack (such as an attack emitting a stronger beam than those of the

normal attack and a ki-attack by two game characters in collaboration) can be instructed by placing two character figures to different readers and performing tap inputs simultaneously on the readers on which the two character figures are placed.

[0075]

While the game processing is being performed, the history of input information by a player (or the history of action instructions to a player's game character PRC) is updated as they occur, and, when the outcome of the game is determined and the game finally comes to end, the game parameters used for the game characters in the game are updated in accordance with the history of input information by a player (step S20). In this case, for the game character corresponding to the character figure with the credit data updated for playing the game, update processing is performed including new setting of the attribute (or the dominance relationship in the fight), rank (skill level), skill (specialty) or the like and increasing/decreasing the value of the statuses such as the strength, striking power, defensive strength and quickness. For a game character used as a supporting character in the game by the additional registration, update processing is performed including increasing/decreasing the value of the statuses by weighting the already defined attribute, rank and skill. Considering

a case where the skill is to be defined, for example, none of the attribute, rank and skill are defined at the first play, but, if a ki-attack is often used in the first play, the ki-attack is defined as the skill, and a weight is defined such that the game parameter for determining the striking power of the ki-attack can be easily increased when the level is raised. Because this updates the game parameters every time the game is played, the enjoyment that a game character can be customized in accordance with the idea input by a player can be given. Furthermore, a player can be motivated to use the game system again next time. As a result, the use of the game can be promoted.

[0076]

In this embodiment, if it is determined that a player has won a fight on the basis of the history of input information by a player in the game processing in step S19, the update processing is performed including raising the level of the game character used by the player in step S20 (or updating the level value as a game parameter) and increasing the values of statuses such as the strength, striking power, defensive strength and quickness in accordance with the level of the game character.

[0077]

The control method of the aforesaid embodiment allows handling the purchase itself of the character figure to

which an RFID tag is mounted as charging for a game.

Because this can motivate a person who wishes to play a game to purchase a character item, the promotion of the purchase of a character item can be sought. Furthermore, because it can also allow a person who wishes to purchase a character item to play a game only by purchasing a character item, the promotion of the use of a game can be sought.

[0078]

According to the control method of this embodiment, update processing is performed on credit data before game processing in which game characters fight against each other is started by using the game parameters stored in a memory in the RFID tag. Supposing that the credit data is updated during the game processing or after the game processing ends, the wrongful usage may not be precluded, including, when the game situation is unfavorable, removing a character figure from the reader/writer unit and abandoning the play to prevent the update of the credit data before the credit data is updated. However, by updating the credit data before the game processing is started as in the control method of this embodiment, the play of a game can be securely charged to play the game.

[0079]

According to the control method of this embodiment, the input required for the game processing can be performed by a

player by causing a character figure to perform a reciprocating motion between the inside of the communication range and the outside of the communication range of the readers of the left reader R1, center reader R2 and right reader R3 or moving a character figure among the left reader R1, center reader R2, and right reader R3. Therefore, without providing the input device such as a button and a lever adopted in a conventional game system, a wide variety of input information by a player can be handled, which can enhance the input interface.

[0080]

3. Application Examples

With reference to Figs. 10 and 11, application examples of the embodiment will be described below.

[0081]

The game system of this embodiment may be configured by connecting multiple game systems GS to a server SVR over a network NET such as the Internet, as shown in Fig. 10. In this case, the credit data may be centrally managed by the server SVR side. In this case, a memory in the RFID tag mounted to a character figure may be only required to store ID authentication data for identifying an individual and game parameters which are setting data for a game character. In the example shown in Fig. 10, before game processing is started, the ID authentication data read from the RFID tag

is transmitted from the game system GS side to the server SVR side over the network NET. The server SVR updates the credit data associated with the received ID authentication data and transmits the information notifying that a game starting condition is satisfied to the game system GS. Starting the game processing after the reception of the notification of the satisfaction of the game starting condition from the server SVR in the game system GS can secure charging for the play of the game.

[0082]

The update processing may be performed on the credit data stored in the RFID tag mounted to a character figure used in the game system of this embodiment such that the game system can be reused by using a home reader/writer (which is an example of the reader/writer unit) as shown in Fig. 11 or the like. For example, in a case where the value subtracted by the game system is stored as the credit data before a game is started, a generic computer COM may be caused to function as a credit update processing unit performing the credit update processing of adding a given value to the credit data stored in a memory in the RFID tag mounted to character figure through an input/output interface of the generic computer COM. In this case, as shown in Fig. 11, the computer COM obtains electronic money data from the server SVR over the Internet, for example, and

adds the obtained value based on the electronic money data from the server SVR to the credit data stored in a memory in the RFID tag mounted to the character figure. Thus, the character figure can be reused in the game system in the same manner as that for a newly purchased character figure.

[0083]

Notably, the present invention is not limited to those disclosed in the embodiment, but various changes can be made thereto. For example, the terms quoted by parentheses as broadly-defined or synonymous terms or the like in the description and illustration in the specification and drawings can be replaced by broadly-defined or synonymous terms in other descriptions and illustrations in the specification and drawings. Having described the embodiment with reference to the example in which a character figure is used as the character item to which the RFID tag is mounted, the RFID tag may be mounted to a trading card, for example.

[0084]

The present invention is also applicable to various game systems such as commercial game systems, home game systems, large amusement systems in which many players participate, simulators, multimedia terminals and cellular phones. The control method of the embodiment is applicable to the execution of various games such as shooting games, fighting games, sport games (such as baseball and soccer

games), music games, role playing games and simulation games.
[0085]

The game system according to the embodiment may further include an operation unit for inputting an operation performed by a player, for example, as data. The functions of the operation unit may be implemented by hardware such as a controller, an operation button, an operation lever, a touch panel and a microphone (or sound input device).

CLAIMS

1. A game system comprising:

a reader/writer unit that performs the transmission/reception of data by radio to/from an RFID tag mounted to a character item and performs a data read operation and write operation on a storage medium included in the RFID tag; and

a game processing unit that performs the transmission/reception of data to/from the reader/writer unit, obtains the data, which is read from the RFID tag, from the reader/writer unit, and performs game processing animating a game character associated with the character item on the basis of the obtained data, wherein:

the storage medium included in the RFID tag stores credit data associated with the number of plays left for a game and a game parameter to be used for the game processing by the game processing unit; and

the game processing unit:

obtains the credit data from the RFID tag through the reader/writer unit, performs update processing on the credit data stored in the storage medium included in the RFID tag through the reader/writer unit on the basis of the satisfaction of a given condition, and starts the game processing after the update processing on the credit data.

2. The game system according to Claim 1, wherein:

the game processing unit:

obtains information depending on the positional relationship between the reader/writer unit and the RFID tag mounted to the character item from the reader/writer unit as input information by a player and performs the game processing.

3. The game system according to Claim 2, wherein:

the reader/writer unit has a plurality of read positions for performing the transmission/reception of data with the RFID tag mounted to the character item and performing a data read operation; and

the game processing unit:

obtains the difference in read position where the transmission/reception of data is performed with the RFID tag in the reader/writer unit as input information by a player and performs the game processing.

4. The game system according to any one of Claims 2 and 3, wherein:

the reader/writer unit has at least one reader/writer that can perform both of a data read operation and write operation on a storage medium included in the RFID tag mounted to the character item and at least one reader that can perform the data read operation only;

the reader/writer and the reader are provided so as to be capable of performing the transmission/reception of data

with the RFID tag in separate communication ranges; and
the game processing unit:

obtains at least one of the fact that the RFID tag performs a reciprocating motion between the inside and outside of the communication range of the reader/writer or the reader within a given period of time and a period of time required by the RFID tag for performing a reciprocating motion between the inside and outside of the communication range of the reader/writer or the reader as input information by a player and performs the game processing.

5. The game system according to any one of Claims 2 to 4, wherein:

the game processing unit:

updates the game parameter stored in the storage medium included in the RFID tag mounted to the character item through the reader/writer unit on the basis of the history of the input information by a player.

6. The game system further comprising a sales unit that receives the insertion of paper currency, a coin or electronic money and provides the character item.

7. A program for a computer having, as an input/output interface, a reader/writer unit that performs the transmission/reception of data by radio with an RFID tag mounted to a character item and performs a data read operation and write operation on a storage medium included

in the RFID tag, the reader/writer unit being employed in the game system according to any one of Claims 1 to 6, wherein:

the storage medium included in the RFID tag stores a value subtracted by the game system as credit data before a game is started; and

the computer is caused to function as a credit update processing unit that performs credit update processing adding a given value to the credit data stored in the storage medium included in the RFID tag through the reader/writer unit in the computer.

8. A program for a game system having a reader/writer unit that performs the transmission/reception of data by radio with an RFID tag mounted to a character item and performs a data read operation and write operation on a storage medium included in the RFID tag, wherein:

a computer in the game system is caused to function as a game processing unit that performs the transmission/reception of data with the reader/writer unit, obtains data read from the RFID tag from the reader/writer unit and performs game processing animating the game character associated with the character item on the basis of the obtained data;

the storage medium included in the RFID tag stores credit data associated with the number of plays left for a

game and a game parameter to be used for the game processing by the game processing unit;

the game processing unit:

obtains the credit data from the RFID tag through the reader/writer unit, performs update processing on the credit data stored in the storage medium included in the RFID tag through the reader/writer unit on the basis of the satisfaction of a given condition, and starts the game processing after the update processing on the credit data.

9. A computer-readable information storage medium that stores the program according to Claim 7 or 8.