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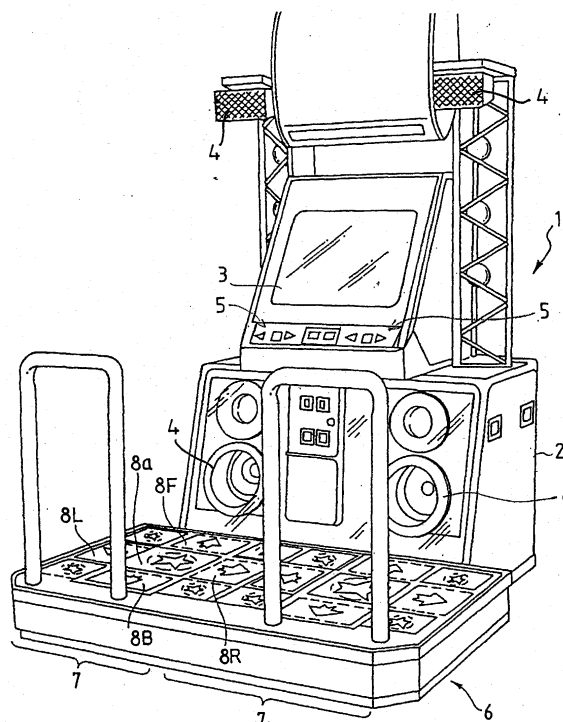
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(54) Game machine and game program

(57) To vary game contents in good harmonization with the operational status of a game machine and the results of a game.

A game machine arranged on the assumption that unspecified number of players play a game with the game machine includes an external memory unit for storing specific information for causing a predetermined variation to occur in game contents, a game executing section for executing the game making use of the specific information, a points managing section for digitizing, each time the game is played in a predetermined play range, the results of the game in the play range according to a predetermined rule and summing up resultant numerical values over a plurality of play ranges, and an execution control section for managing a prohibited state of use of the specific information used by the game executing section and removal of the prohibited state based on the value summed up by the points managing section.

FIG. 1



Description

[0001] The present invention relates to a game machine with which unspecified number of players play a game, and which particularly causes varieties in a game such as occurrence of hidden elements and the like when a predetermined condition is satisfied, and a game program thereof.

[0002] A game machine disclosed in Japanese Patent Application Laid-Open No. 9-276550 is known as a game machine which suppresses a decrease in an ability for pulling in customers by appropriately varying game contents based on an operational status and the like of the game machine. This game machine includes a memory device that stores upgrade information for upgrading game contents and an upgrade device for upgrading the game contents by automatically reading the upgrade information based on a predetermined upgrade condition. Further, the publication discloses as the upgrade condition that specific date and hour have been reached, a player has played a game the predetermined number of times, and the average score of the player exceeds a predetermined criterion.

[0003] However, when the game contents are updated under the condition that the specific date and hour have been reached, the game contents are varied regardless of the state of the play with the game machine. Accordingly, the game contents are sometimes varied before players get weary of the game contents. Therefore, there is a possibility that the value of the variation of the game contents is relatively reduced.

[0004] When the game contents are updated based on the number of times a game has been played using the game contents regardless of scores achieved in the game, there is a possibility that players' incentive for familiarizing with the game is declined because skills of players are not reflected to the upgrade of the game contents. Note that the similar problem is also arisen when date and hour are used as the condition.

[0005] When the game contents are updated based on the average score of a game, the beginners sometimes hesitate to play the game because the play of the beginners reduces the average score and it causes the update of the game contents to delay. As a result of that, there is a possibility that a revenue obtained from a game machine is adversely affected.

[0006] An object of the present invention is to provide a game machine capable of varying game contents in good harmonization with an operational status of the game machine and the result of the game in game machines with which unspecified number of players play games, and a game program thereof.

[0007] Further, another object of the present invention is to provide a game machine capable of sufficiently attracting interests of players by devising modes in which game contents are varied even if they are varied based on the number of play times, a period of play, scores, and the like.

[0008] A game machine and a game program of the present invention will be described below.

[0009] According to one aspect of the present invention, there is provided the first game machine arranged on the assumption that unspecified number of players play a game with the game machine characterized by comprising: a memory device for storing specific information for causing a predetermined variation to occur in game contents; an execution device for executing the game making use of the specific information; a summing-up management device for digitizing, each time the game is played in a predetermined play range, the result of the game in the play range according to a predetermined rule and summing up resultant numerical values over a plurality of play ranges; and an execution control device for managing a prohibited state of use of the specific information used by the execution device and managing removal of the prohibited state, based on the value summed up by the summing-up management device.

[0010] According to another aspect of the present invention, there is provided the first game program characterized by being arranged to cause a game machine as a computer arranged on the assumption that unspecified number of players play a game to function as: a memory device for storing specific information for causing a predetermined variation to occur in game contents; an execution device for executing the game making use of the specific information; a summing-up management device for digitizing, each time the game is played in a predetermined play range, the result of the game in the play range according to a predetermined rule and summing up resultant numerical values over a plurality of play ranges; and an execution control device for managing a prohibited state of use of the specific information used by the execution device and managing removal of the prohibited state, based on the value summed up by the summing-up management device.

[0011] According to the game machine and the game program, the results of a game in each play range are digitized and the digitized value is related to the control of a prohibited state of use of specific information and the control of removal of the prohibited state, thereby the skill of each player is reflected to a variation of game contents. Moreover, the values obtained by digitizing the results of the game are summed up over a plurality of play ranges and the summed-up value is related to switching between the prohibited state of use of the specific information and the removal thereof, thereby the summed-up value is updated at a different pace between a game machine which is played repeatedly with a high-frequency and a game machine which is played repeatedly with a low frequency. Accordingly, the operational status of the game machine affects the state of use of the specific information. As a result of that, the game contents can be varied in good harmonization with the operational status of the game machine and the results of the game.

[0012] In the present invention, the play range may be determined from various points of view. For example, the play range may be divided by time or by each predetermined unit as to the game contents (for example, a concept of a stage, event, and the like). In a so-called arcade game machine of a type which permits a player to play a game in exchange for consumption of a predetermined economic value, a range determined in relation to the predetermined economic value may be determined as the play range of the present invention. The economic value described here may be represented by money, or by medals, coins, or tokens, which are scrip coins used in place of money, or by an electronic symbols such as cybermoney and a point issued by a game arcade.

[0013] The specific information may be a specific data referred to by the game program or may be the game program itself. The variation of the game contents caused by using the specific information may be realized as any variation occurring in an existing game, that is, an addition, modification, and deletion of an element, for example, a character, item, stage, and the like, or may be realized as an addition of a game itself.

[0014] Whether or not the game machine and the game program of the present invention are arranged on the assumption that the game is played by unspecified number of players can be determined by whether or not the values, which are obtained by digitizing the results of the game played in each of a plurality of play ranges corresponding to each of the different players, are summed up. When the results of the game played by unspecified number of players are digitized and summed up, the unspecified number of players play the game in joint effort with each other with a common game machine in expectation of a variation such as occurrence of a hidden element, and the like, thereby the game machine is used more frequently to play a game. Accordingly, there can be obtained an outstanding operation/working-effect that an operating rate of the arcade game machine gets higher and the revenue of the game machine is increased. Since the game contents are not varied unless players play a game, an owner or manager of the game machine must make efforts to get players, from which a secondary effect can be expected in that maintenance of the game machine is executed without default.

[0015] In the present invention, the concept of the summing-up is not limited to a concept of adding numerical values and also includes a case in which a numerical value is subtracted from a predetermined initial value. Further, the concept of the summing-up also includes a case in which numerical values corresponding to a plurality of play ranges are cumulatively increased or decreased by executing an arithmetic operation which is more complicated than addition and subtraction.

[0016] In the present invention, the memory device may store a plurality of types of the specific information, and the execution control device may remove the pro-

hibited state of specific information which is different from each other each time the summed-up value reaches a predetermined target value. Further, the execution control device may remove the prohibited state of the respective types of the specific information in a predetermined order. In this case, the game contents can be varied stepwise in the predetermined order.

[0017] The execution control device may change the order in which the prohibited state of the specific information is removed based on time interval at which the prohibited state is removed. According to this execution control device, the game contents can be varied in a different manner between the case in which the values obtained by digitizing the results of a game are summed up at a high pace and the case in which they are not summed up at a high pace. Accordingly, there can be reduced a possibility of predicting the variation of the game contents of a game machine having the low pace based on the variation of the game contents of a game machine having the high pace, resulting in that a possibility that a pleasure the game machine having the low pace provides is diminished can be excluded.

[0018] For example, when the time interval at which the prohibited state is removed is shorter than a predetermined reference value, the execution control device may suspend removal of the prohibited state of the specific information to come next and may move up removal of the prohibited state of the specific information which is expected to come later than the specific information to come next so as to realize the change of the order.

[0019] Further, the execution control device may sequentially remove the prohibited state of the specific information whose removal has been suspended based on the summed-up value and the target value after removing the prohibited state of the specific information whose order is set to a final order. Because of that, all the previously prepared variations can be occurred even in the game machine having the high pace.

[0020] Note that when the removal is moved up as described above, it is preferable that the execution control device sets the target value to remove the prohibited state of the specific information whose removal has been suspended to a value larger than an original target value which is set to remove the prohibited state of the same specific information without the suspension. Because of that, to remove the prohibited state of the specific information whose removal has been suspended once, the results of a game must be summed up over more play ranges as compared with a case in which the removal of the prohibited state has not been suspended. Accordingly, a variation based on the suspended specific information cannot be easily occurred, thereby the balance can be kept between a game machine excellent in an operational status and a game machine not excellent in it.

[0021] The execution control device may further include a suspension number count device for counting the number of suspending the removal of prohibited

state and a bonus application device for creating an extra bonus in the game contents when the suspension number reaches at least a predetermined value. In this case, a certain bonus can be occurred in a game machine having a large number of suspension number, thereby a disadvantage, which is caused by an increase in a load necessary to remove the prohibited state of use of the suspended specific information, can be cancelled by the bonus.

[0022] The execution control device may change the target value based on the time interval at which the prohibited state is removed. For example, the execution control device may reduce the target value when the time interval from time at which the prohibited state of a piece of specific information is removed to time at which the prohibited state of a next piece of specific information is removed is equal to or larger than a predetermined value. Because of that, the appropriate making-up can be given to the game machine which is not excellent in the operational status and which has an excessively low pace at which the prohibited state of use is removed. Otherwise, in the game machine whose prohibited state is removed at short time intervals, the pace at which the prohibited state of use is removed can be adjusted by increasing the target value of the game machine.

[0023] The execution device may execute a game by classifying a degree of difficulty into a plurality of levels, and the summing-up management device may evaluate the results of the game by individually classifying the results into predetermined steps in each difficulty level and may digitize the steps of evaluation based on a rule common to the respective difficulty levels. When the evaluation is executed stepwise in each level and the evaluated level is digitized, the results of the game can be digitized based on a relative evaluation in a range having the same difficulty level regardless of whether the difficulty level is high or low, in such a manner that, even if a game whose difficulty level is low is played, the results of the game are converted into a relatively large value as long as a relatively high evaluation can be obtained in the low difficulty level. Then, the above evaluation permits even a beginner to sufficiently contribute to the summing-up of the game results by selecting the difficulty level suitable for him or her. As a result of that, even the beginner can play a game without any hesitation.

[0024] Further, the execution device can execute the game with guiding a series of operations for an input unit to a player as well as with evaluating a degree of agreement between an operation guided by the execution device and an operation actually executed by the player as to each operation included in the series of the operations, and the summing-up management device may digitize the results of the game based on the ratio of the number of operations which get evaluation equal to or higher than a predetermined level of the respective operations to the total number of operations included in the

series of the operations. When the results of the game are digitized based on the ratio, the difficulty level can be changed by changing the total number of the operations to be guided, whereas as long as the respective guided operations are executed one by one without fail, the results of the game can be converted into the same numerical value or a numerical value of the same level regardless of whether the difficulty level is high or low.

[0025] According to still another aspect of the present invention, there is provided the second game machine arranged on the assumption that unspecified number of players play a game with the game machine characterized by comprising: a memory device for storing a plurality of types of specific information for causing a predetermined variation to occur in game contents; an execution device for executing the game making use of the specific information; and an execution control device for sequentially removing a prohibited state of the plurality of types of the specific information each time a predetermined removal condition relating to an operational status of the game machine is satisfied, wherein when a predetermined order change condition relating to the operational status is not satisfied, the execution control device removes the prohibited state in a predetermined order, whereas when the predetermined order change condition is satisfied, the execution control device changes the order in which the prohibited state is removed from the predetermined order.

[0026] According to the game machine, while the variation of the game contents is controlled based on the operational status of the game machine, since the order, in which the prohibited state is removed, is changed when the order change condition relating to the operational status is satisfied, a mode in which the game contents are varied can be variously changed. Because or which, the game contents can be variously diversified, thereby players' interest can be attracted.

[0027] Note that the removal condition and the order change condition can be set in correspondence to various values relating to the operational status of the game machine. For example, the execution control device may determine whether or not the removal condition or the change condition is satisfied in relation to at least any one of the number of times the game is played in a predetermined play range, a period of time during which the game is played in the play range, and scores given to the play in the play range. In this case, the concept of the play range is as described above. The execution control device may change an order in which the prohibited state of the specific information is removed based on a time interval at which the removal condition is satisfied. The time interval in this case is also grasped eventually as a value related to the operational status in that the interval is relatively short when the operating rate of the game machine is high, whereas the interval is relatively long when the operating rate is low.

[0028] In the second game machine, when the time interval, at which the removal condition is satisfied, is

shorter than a predetermined reference value, the execution control device may suspend removal of the prohibited state of the specific information to come next and may move up removal of the prohibited state of the specific information which is expected to come later than the specific information to come next so as to realize the change of the order. The execution control device may remove the prohibited state of the specific information whose removal has been suspended based on whether or not the removal condition is satisfied after the execution control device removes the prohibited state of the specific information whose order is set to a final order. The execution control device may set the removal condition used to remove the prohibited state of the specific information whose removal has been suspended more strictly than an original removal condition which is set to remove the prohibited state of the same specific information without the suspension. The execution control device may further include a suspension number count device for counting the number of suspending the removal of prohibited state and a bonus application device for creating an extra bonus in the game contents when the suspension number reaches at least a predetermined value. The execution control device may change the removal condition based on the time interval at which the prohibited state is removed. The execution control device may ease the removal condition when a time interval from time at which the prohibited state of a piece of specific information is removed to time at which the prohibited state of a next piece of specific information is removed is equal to or larger than a predetermined value.

[0029] According to still another aspect of the present invention, there is provided the second game program characterized by being arranged to cause a game machine as a computer arranged on the assumption that unspecified number of players play a game to function as: a memory device for storing a plurality of types of specific information for causing a predetermined variation to occur in game contents; an execution device for executing the game making use of the specific information; and an execution control device for sequentially removing a prohibited state of the plurality of types of the specific information each time a predetermined removal condition relating to an operational status of the game machine is satisfied, wherein when a predetermined order change condition relating to the operational status is not satisfied, the execution control device removes the prohibited state in a predetermined order, whereas when the order change condition is satisfied, the execution control device changes the order in which the prohibited state is removed from the predetermined order.

[0030] The computer acts as the second game machine by executing the second game program by the computer.

In the Drawings:

[0031]

FIG. 1 is a view showing an outside arrangement of a game machine according to an embodiment of the present invention;

FIG. 2 is a view showing an example of a game image displayed on a monitor of the game machine of FIG. 1;

FIG. 3 is a function block diagram showing a control system of the game machine of FIG. 1;

FIG. 4 is a view showing contents of a dance level judge table stored in an external memory unit of the game machine of FIG. 1;

FIG. 5 is a view showing contents of a points judge table stored in the external memory unit of the game machine of FIG. 1;

FIG. 6 is a view of an example of judging a dance level in the game machine of FIG. 1;

FIG. 7 is a view showing a relationship between an occurring order of hidden elements and a target points in the game machine of FIG. 1;

FIG. 8 is a view showing contents of a target points table stored in the external memory unit of the game machine of FIG. 1;

FIG. 9 is a view showing an example in which the occurring order of the hidden elements is changed from that shown in FIG. 7;

FIG. 10 is a flowchart showing a procedure of play finish processing executed by a control unit of the game machine of FIG. 1;

FIG. 11 is a flowchart showing a procedure of summing-up processing executed by the control unit of the game machine of FIG. 1;

FIG. 12 is a flowchart showing a procedure of occurrence processing executed by the control unit of the game machine of FIG. 1;

FIG. 13 is a flowchart showing a procedure of target points set processing executed by the control unit of the game machine of FIG. 1; and

FIG. 14 is a view showing an example, which is displayed on a screen, of the number of points needed until a target number of points is achieved.

[0032] FIG. 1 shows an example of a game machine to which the present invention is applied. The game machine 1 is installed in a so-called amusement establishment such a game arcade and the like and arranged as an arcade game machine with which a player is permitted to play a game within a predetermined range in exchange for consumption of a predetermined economic value. A cabinet 2 of the game machine 1 has a monitor 3, speakers 4, push button type push switches 5 acting as input units, and the like appropriately attached thereto as usual. Further, the game machine 1 is provided with a stage 6 acting as an input unit. The stage 6 has a pair of right and left dance areas 7 and 7 each of which

is provided with four foot switches 8F, 8B, 8R, and 8L which are positioned front, back, right, and left when viewed from the center 7a thereof (hereinafter, these foot switches are represented by reference numeral 8 in some cases). The foot switches 8 detect a depressing motion of a player and output a predetermined detection signal.

[0033] A so-called dance game is executed in the game machine 1 in such a manner that predetermined music is replayed through the speakers 4 as well as a step motion to the replayed music is directed to a player through the monitor 3. FIG. 2 shows a game image 201 in which the step motion in the dance game is directed. The game image 201 has a pair of right and left instruction regions 202R and 202L disposed thereon, and four stationary marks 203F, 203B, 203L, and 203R (hereinafter, they are represented by reference numeral 203 in some cases) are displayed in these instruction regions 202R and 202L, respectively in correspondence to the foot switches 8F, 8B, 8R, and 8L. While the music is being replayed, moving marks 204F, 204B, 204R, and 204L (hereinafter, they are represented by reference numeral 204 in some cases) are scrolled and displayed from a lower end of a screen toward the stationary marks 203 at a speed to the tempo of the music by a predetermined procedure. When the player depresses a foot switch 8 corresponding to a stationary mark 203 at a timing at which a moving mark 204 agrees with the stationary mark 203, a step motion suitable for the music being replayed is realized. Timings at which the moving marks 204 agree with the stationary marks 203 are compared with timings at which the foot switches 8 detect the depressing motions of the player for each of the marks 204, and a dance level of the player is judged based on a result of comparison. Note that, in the above dance game, any one of a 1P mode, in which one player plays the game according to whichever instruction in the instruction region 202R or 202L, a 2P mode, in which two players play the game according to instructions in the instruction regions 202R and 202L, and a double mode, in which one player plays the game according to both of the instructions in the instruction regions 202R and 202L, can be selected.

[0034] FIG. 3 is a block diagram showing an arrangement of a control system of the game machine 1. The game machine 1 includes a control unit 10 having a microprocessor and a peripheral circuit such as a register and the like necessary to the operation of the microprocessor, a main memory unit 11 connected to the control unit 10, and an external memory unit 12. The main memory unit 11 includes a ROM and a RAM each making use of a semiconductor memory element, and the RAM provides a working region to the control unit 10. The external memory unit 12 is composed of a memory unit, which does not require a memory maintaining power supply, such as a floppy-disk memory unit, a hard-disk memory unit, a CD-ROM memory unit and a DVD-ROM memory unit.

[0035] Stored in the memory unit 12 are a game program PG1 for executing the dance game in the game machine 1, and game execution data D, a dance level judge table T1, a points judge table T2, and a target points table T3 which are data to be referred to in the program PG1. Further, connected to the control unit 10 are an input unit 13, an image processing unit 14, and a sound processing unit 15. The input unit 13 includes the push switches 5 and the foot switches 8 of FIG. 1, and outputs a signal corresponding to an operations by the player. The image processing unit 14 creates an image display signal according to an instruction from the control unit 10 and outputs the signal to the monitor 3 acting as a display unit. The image processing unit 15 creates a sound replay signal according to an instruction from the control unit 10 and outputs the signal to the speakers 4 at the respective portions.

[0036] When the control unit 10 executes the game program PG1, a game executing section (an execution device) 10a, a points managing section (a summing-up management device) 10b, and an execution control section (an execution control device) 10c are logically arranged in the control unit 10. Note that at least any one of the respective sections 10a to 10c may be constructed by a hardware logic circuit.

[0037] The game executing section 10a executes the dance game described above based on various types of data included in the game execution data D as well as judges the dance level of the player making use of the dance level judge table T1. The game execution data D includes data Da1, Da2, ... prepared for each piece of music. While the data Da1, Da2, ... for each piece of music includes music replay data for replaying and outputting music to be the subject of dancing through the sound processing unit 15, step data for displaying the marks 203 on the game image 201 of FIG. 2, and the like, the detailed illustration thereof is omitted.

[0038] The game execution data D further includes hidden element data Db1, Db2, ... for causing the hidden elements to occur in the game contents. The data Db1, Db2, ... corresponds to the specific information. A plurality of types of the hidden elements are prepared, the occurring orders of which are determined. Data DbN is the data for causing an Nth hidden element to occur. Various types of elements may be predetermined as the hidden elements. For example, specific music may be set as a hidden element. In this case, the data necessary to execute a game based on the music which is set as the hidden element, that is, music replay data, step data of the music, and the like are prepared as the data of the hidden element. A plurality of types of step data may be prepared as to the same music, and some or all of the step data may be set as the data of a hidden element. Note that, though the data Da1, Da2, ... is discriminated by each piece of music in FIG. 3, it does not restrict a physical recording structure of data in the actual external memory unit.

[0039] While the data of the external memory unit 12

is previously prepared by a producer of the game program PG1, a mode, in which step data made by the player himself/herself can be read into the game machine, is also prepared in the game machine 1 of the present invention. In the following description, the step data introduced into the game machine 1 by the player is called edit data so that it is discriminated from the data prepared in the external memory unit 12 from the beginning.

[0040] The points managing section 10b converts the dance level judged by the game executing section 10a into points and accumulates the points to accumulated points Pa in the main memory unit 11. The execution control section 10c controls a prohibited state of use of the data Db1, Db2, ... of the hidden elements which is used by the game executing section 10a and removal of the prohibited state by each of the hidden elements referring to the accumulated points Pa. As long as the prohibited state is removed by the execution control section 10c, no variation occurs in the game based on the data of the hidden element. To set the prohibited state of use and remove the prohibited state, for example a flag for discriminating between the prohibited state of use and the removal state (the available state) can be set for each hidden element.

[0041] Note that the occurrence of the hidden elements may be realized in various fashions. When, for example, music is prepared as a hidden element, in response to the permission of occurrence of the hidden element, the permitted music may be added to and displayed in a music selection menu so that the player can select the music. Further, when the occurrence of a hidden element is permitted, a game play may be based on the hidden element may start without the selection of the player.

[0042] Next, evaluation of the dance level executed by the game executing section 10a, accumulation of points executed by the points managing section 10b, and control of occurrence of the hidden elements executed by the execution control section 10c will be described with reference to FIGS. 4 to 9.

[0043] First, the evaluation of the dance level will be described. The game executing section 10a permits the player to play a game within a predetermined play range in exchange for consumption of a predetermined economic value. The play range may be determined by the predetermined number of pieces of music or by a playing period of time. The play range may be dynamically changed in consideration of scores gotten by a player during the game, i. e., a player whose contents of play are excellent may be permitted to play the game with more pieces of music or for a longer period of time. Here, the description will be continued on the assumption that one play range is finished when a game is played with five pieces of music.

[0044] Then, the game executing section 10a evaluates a degree of agreement of a timing, at which a motion for depressing a foot switch 8 is indicated while each piece of music is played, with a timing, at which the in-

dicated foot switch 8 is actually depressed (the detected timing by the depressed foot switch 8) by each moving mark 204 and evaluates a deviation between both the timings by classifying the deviation into several levels.

5 In addition, the game executing section 10a stores a result of evaluation of each moving mark 204 in a predetermined address region of the main memory unit 11 as a play record PR. When a play is finished in one play range, the game executing section 10a refers to the play
10 record PR of each piece of music included in the play range and determines the ratio of the number Nper of moving marks 204 given the highest evaluation to the total number Nall of the moving marks 204 appearing in the piece of the music ((Nper/Nall) x 100). Then, the
15 resultant ratio is applied to the dance level judge table T1, thereby the game executing section 10a evaluates the play contents of each piece of music with predetermined levels. As shown in FIG. 4, the dance level judge table T1 has the dance levels classified into seven from the
20 highest level AAA to the lowest level E. To obtain the highest level AAA, requirements must be satisfied in that the number of times that the highest level AAA is given is at least 99% of the total number of the moving marks 204, that is, the player correctly executes dance steps
25 as to approximately all of the moving marks 204. Thereafter, the ratio to be required gets lower in proportion to the lower dance level. the obtained dance levels are appropriately stored in the main memory unit 11.

[0045] Next, the conversion of points executed by the points managing section 10b will be described. The
30 points managing section 10b converts a dance level in a play range into a point number according to a predetermined criterion referring to the points judge table T2. As shown in FIG. 5, the points judge table T2 records the levels AAA to E included in the dance level judge
35 table T1 and the value of the points given to the respective levels. The points managing section 10b obtains the point value corresponding to the respective dance levels of each piece of music stored in the dance level judge table T1, from the points judge table T2, and determines
40 the sum of the obtained point values, thereby the points-managing section 10b obtains the point value for one play range. When, for example, the dance level of the respective pieces of music has been evaluated as shown in FIG. 6, 13 points are given in this play range.
45 Each time the point is obtained in one play range, the points managing section 10b adds the obtained point value to the accumulated points Pa recorded in the main memory unit 11. Because of that, the point values are summed up over a plurality of play ranges. In the 2P mode, the dance level is evaluated for each player and the point is accumulated separately for each of the players. In the double mode, the point is double value of the point determined with reference to the points judge table
50 T2.

[0046] Note that while the relationship between the dance level and the point value is set such that a higher dance level results in higher points, a degree of change

of the relationship may be appropriately determined. For example, the point may be obtained only when his/her dance level is evaluated at the highest level AAA. Dance games executed by the game machine 1 have a concept of the difficulty level, and a player can sometimes select his/her desired difficulty level when he/she selects music and a stage (for example, which is composed of a plurality of pieces of music). The difficulty level may be different, for example, according to each tune, or a plurality of difficulty levels may be set to the same tune. The difficulty level of the same music can be adjusted by changing the total number of the moving marks 204 appearing while the tune is replayed. When, for example, the difficulty level classified into three levels, that is, high, medium, and low levels is prepared, the total number of the moving marks 204 is differentiated such that 100 pieces of the moving marks 204 appear for the low level, 200 pieces appear for the medium level, and 300 pieces appear for the high level. However, since the dance level is evaluated by the ratio of the number of the moving marks 204 given the highest evaluation to the total number of the moving marks 204, a chance for obtaining the maximum points is guaranteed even if the difficulty level is set to any of the high, medium, or low level. That is, the result of game is evaluated and digitized for each of the difficulty levels. Because of that, not only a player having an excellent skill but also a beginner can sufficiently contribute to the occurrence of the hidden elements by selecting the difficulty level suitable to him/her. Thus, the possibility that the beginner hesitates to play the game can be diminished.

[0047] Next, control of the hidden elements executed by the execution control section 10c in relation to the accumulated points Pa will be described. FIG. 7 shows a relationship between occurrences of the hidden element controlled by the execution control section 10c and the accumulated points Pa summed up by the points managing section 10b. When a game is played for the first time using the game program PG1, the accumulated points Pa is 0. When predetermined points (1350 points) are stored as the accumulated points Pa, a hidden element 1 occurs, and when another 1350 points are further stored from the above state, the next hidden element 2 occurs. In this manner, permission or prohibition of the occurrence of the hidden elements (prohibition of use of hidden element data and the removal of the prohibition) is controlled according to the accumulated points Pa until a hidden element 30, whose occurring order is set to the final. The points to be stored for the hidden element to occur are predetermined in the target points table T3 as shown in, for example, FIG. 8. The execution control section 10c, referring to the target points table T3, acquires the point to be stored for the next hidden element to occur and stores the acquired point in the main memory unit 11 as the target points Po. Then, the execution control section 10c controls the occurrence of the hidden element by comparing the target points Po with the accumulated points Pa.

[0048] Incidentally, a pace at which the points are accumulated is different among game machines, arcades and the like. Accordingly, when the occurrences of the hidden element is uniformly processed in all the game machines 1 as shown in FIG. 7, there is a possibility that a game machine having a fast accumulation pace gains more popularity among players and a game machine having a slow accumulation pace becomes unprofitable. Then, in this embodiment, a period of time for the accumulated points Pa to reach the target points Po is reflected to the control of the occurrence of the hidden elements. FIG. 9 shows an example of that. In FIG. 9, when the accumulated points Pa which are more than the needed points for the hidden element 1 to occur are stored in three days (72 hours) from the moment of the completion of preparation of points accumulation, the occurrence of the hidden element 1 is omitted (suspended), and the occurrence of the hidden element 2 is moved up. The occurring order of the hidden elements is set such that the stronger attraction to players the hidden element has, it occurs in the later half of the order. Accordingly, as some occurrences of a part of the hidden elements are omitted in consideration of a time factor, the hidden elements more attractive to players occur at early time in the game machine having the fast accumulation pace. Because of that, it can be expected that the attraction of customers is improved. In contrast, the hidden elements, which do not yet occur in the game machine having the fast accumulation pace, occur in the game machine having the slow accumulation pace, which can sufficiently attract the interest of players.

[0049] Note that the final hidden element 30 cannot be omitted in any of the game machines 1. After the final hidden element 30 occurs in the game machine 1 in which the occurrence of a part of the hidden elements is omitted, the game machine 1 enters a compensation mode, which is the second round in which the hidden elements whose occurrences were omitted can occur. In the compensation mode, if the larger value than the points predetermined in the target points table T3 is set as the target points Po, the sufficient consideration can be given to the game machine having the slow accumulation pace. However, setting the value larger than the value predetermined in the target points table T3 as the target points Po imposes an excessive load on the game machine having the fast accumulation pace. Because of that, there is a possibility that the new unbalance happens among game machines having different accumulation paces. Consequently, a specific hidden element (bonus element) is additionally caused to occur only in a game machine 1 in which the number of hidden elements omitted until the hidden element 30 occurs exceeds a predetermined number. The bonus element is also one kind of hidden elements and can be caused to occur by preparing data of the bonus element (not shown) similarly to the data Db1, Db2, ... of the hidden elements 1 and 2.

[0050] Next, various kinds of processing executed by

the control unit 10 to control the occurrence of the hidden element will be described with reference to FIGS. 10 to 14.

[0051] FIG. 10 is a flowchart showing a procedure of play finish processing executed by the control unit 10 when a game play is finished in one play range. In the finish processing, the control unit 10 converts the dance levels in the play range into the points and adds the points to the accumulated points Pa (summing-up processing at step S1). Next, it is determined whether or not the accumulated points Pa has reached the target points Po (step S2). When the target points Po has been reached, the process goes to step S3, whereas when the target points Po has not been reached, the process goes to step S10. At step S3, an arrival time spent from the occurrence of a previous hidden element to the present moment is calculated. The arrival time can be determined by providing the game machine 1 with, for example, a real time clock to record the date and hour at the moment when the hidden element occurred last time.

[0052] Next, a hidden element is caused to occur (the occurrence processing at step S4). At step S5, it is determined whether or not the hidden elements remain which are not yet caused to occur, and when the hidden elements still remain, the value of the target points Po for the next hidden element to occur is set (the target points set processing at Step S6). Then, the accumulated points Pa in the main memory unit 11 is reset to 0 (step S7), the present date and hour for calculating the arrival time is recorded in a predetermined region of the main memory unit 11 (step S8), and then the process goes to step S10.

[0053] When the determination at step S5 is "NO", that is, when all hidden elements have occurred, it is determined whether or not the flag for permitting the occurrence of the bonus element has been set (step S9). When the flag has been set, the process goes to step S6, whereas when the flag has not been set, the process goes to step S10.

[0054] At step S10, the value of the necessary point to cause the next hidden element to occur is specified from the accumulated points Pa at present and the target points Po, and displayed the necessary points on the screen of the monitor (display unit 3) as shown in, for example, FIG. 14. As displaying the necessary points as described above, the motivation for repeating the game with the specific game machine 1 can be given to unspecified number of players for the hidden element to occur. FIG. 11 is a flowchart showing a procedure of summing-up processing (step S1 of FIG. 10) executed by the control unit 10. In the summing-up processing, the control unit 10 specifies a dance level corresponding to play contents of each tune stored as the play record PR, referring to the dance level judge table T1 (step S21). Next, the control unit 10 converts the specified dance level to the points, referring to the points judge table T2 (step S22). Subsequently, it is determined

whether or not a game is played based on the edit data, and when the determination is "NO", the control unit 10 adds the obtained points to the accumulated points Pa (step S24). When it is determined that the game is played based on the edit data, it is determined whether or not the value of the points calculated at step S22 is the maximum value (here, 10 points) in the points judge table T2 (step S25). When it is determined that the calculated points is 10 points, the calculated points is changed to 1 point (step S26), and then the process goes to step S24. When it is determined that the calculated points is not 10 points, the process skips step S26 and goes to step S24.

[0055] The reason why the maximum points is not given in the game played based on the edit data is to prevent the accumulated points Pa from being accumulated unduly rapidly in such a manner that a player or a manager of the game machine 1 introduces the step data whose difficulty level is lower than the step data previously prepared in the external memory unit 12 (for example, the total number of the moving marks 204 is one) and repeats the game based on the introduced step data. FIG. 12 is a flowchart showing a procedure of occurrence processing (step S4 of FIG. 10) executed by the control unit 10. In the occurrence processing, the control unit 10 determines whether or not the hidden element, planned to occur, occurs in the first round (step S41). This determination is made by determining, for example, whether or not the flag indicating that the hidden element 30 has already occurred has been set. Next, it is determined whether or not the hidden element planned to occur is the final hidden element 30 (step S42). When it is determined that the hidden element planned to occur is not the final hidden element 30, it is determined whether or not the arrival time calculated at step 3 of FIG. 10 is within three days (step S43). When it is determined that the arrival time is not within three days, the process goes to step S48 at which the next hidden element is caused to occur according to a predetermined order. When it is determined that the arrival time is within three days, the occurrence of the hidden element, planned to occur according to the original order, is omitted, and the hidden element after the next hidden element is caused to occur (step S44). Then, 1 is added to the number of the omitted hidden elements stored in the main memory unit 11 (step S45), and the processing is finished.

[0056] When it is determined at step S42 that the hidden element planned to occur is the final hidden element 30, it is determined whether or not the number of the omitted hidden elements is 7 or more (step S46). When it is determined that the number of the omitted hidden elements is 7 or more, the flag for permitting the occurrence of the bonus element is set (step S47). When it is determined that the number of the omitted hidden elements is less than 7, the process skips step S47. Then, the final hidden element 30 planned to occur at step S48 is caused to occur.

[0057] When it is determined that the round is not the first round at step 41, the process goes to step S49 at which the hidden elements omitted in the first round are caused to occur sequentially from the one having the earlier occurring order originally, and the processing is finished. However, when the occurrence of the bonus element is permitted, the bonus element is caused to occur at the end of the second round.

[0058] FIG. 13 is a flowchart showing a procedure of target points set processing (step S6 of FIG. 10) executed by the control unit 10. In the target points set processing, the control unit 10 determines whether or not the hidden element planned to occur next occurs in the first round (step S61). When it is determined that the round is the first round, it is determined whether or not the arrival time calculated at step 3 of FIG. 10 exceeds seven days (step S62). When it is determined that the arrival time does not exceed seven days, the value of the target points Po is set to the value predetermined in the target points table T3 (step S63). In contrast, when it is determined that the arrival time exceeds seven days, the value of the target points Po is set to half the value of the target points table T3 (step S64).

[0059] When it is determined that the round is not the first round, it is determined at step S65 whether or not the arrival time exceeds seven days. When it is determined that the arrival time does not exceed seven days, the target points Po is set to 2000 points (step S66), whereas when it is determined that the arrival time exceeds seven days, the target points is set to 1000 points which is half the 2000 points (step S67).

[0060] As described above, the status that a game machine having a poor customer pulling record is greatly disadvantageous to a game machine having excellent customer pulling record can be avoided, by setting the target points Po to a value half a planned value when the arrival time exceeds seven days. When, for example, a skilled player plays a game using a low use game machine 1, and because of that, if the omission of the hidden element is executed in the game, there is a possibility that a very long period of time is required until 2000 points are accumulated in an original state to compensate the hidden element. The above state can be avoided by the processing of FIG. 13.

[0061] The present invention is by no means limited to the embodiment described above and may be executed in various manners. For example, the present invention is not limited to the dance game machine and can be applied not only to other music game machines but also to various types of game machines to which the concept of hidden element can be applied. In the above embodiment, results of a game are digitized and summed up. Each time the summed-up value reaches a target value, a prohibited state of occurrence of hidden elements is removed in a predetermined order as well as an order in which the hidden elements occur is controlled based on time interval at which the prohibited state is removed. However, the control for changing the

order in which game contents are varied is not always applied only to the game machine which employs the method of digitizing the results of a game and can be also applied to other game machines. For example, even in a game machine in which hidden elements are caused to occur in a predetermined order each time the number of times of play reaches the predetermined number of times, the occurring order of the hidden elements can be changed as described above according to whether time interval at which the hidden elements occur is long or short. The above control can be also applied likewise to a case in which the hidden elements are caused to occur each time a predetermined period of time of play is reached and to a case in which the hidden elements are caused to occur each time the score of a game is accumulated to predetermined score, in place of the control in which the hidden elements are caused to occur based on the number of times of play. The occurring order of the hidden elements may be changed by evaluating the number of times of play, the period of time of play and the scores in combination. When a removal condition is set such that a next hidden element is caused to occur when a game has been played, for example, for 1000 hours, the number of times of play and the score are accumulated in conjunction with the period of time of play, and the occurring order in which the hidden elements occur may be changed when the number of times of play and the score satisfy an order change condition at the time or before the removal condition that the game is played for at least 1000 hours is satisfied.

[0062] As described above, according to the game machine and the game program of the present invention, the results of a game of each play range are digitized and the digitized value is related to the control of a prohibited state of use of specific information and the control of removal of the prohibited state, thereby the skill of each players is reflected to a variation of game contents. Moreover, the values obtained by digitizing the results of the game are summed up over a plurality of play ranges and the summed-up value is related to the switching between the prohibition of use of the specific information and the removal of the prohibition, thereby the summed-up value is updated at a different pace between a high use game machine and a low use game machine. Accordingly, the operational status of the game machine affects the state of use of the specific information. As a result of that, the game contents can be varied in good harmonization with the operational status of the game machine and the results of a game.

[0063] Further, according to another game machine and game program of the present invention, while the variation of the game contents is controlled based on the operational status of the game machine, since an order, in which the prohibited state is removed, is changed when the order change condition relating to the operational status is satisfied, a mode in which the game contents are varied can be variously changed. Because

of that, the game contents can be variously diversified, thereby players' interest can be attracted.

Claims

1. A game machine (1) arranged on the assumption that unspecified number of players play a game with the game machine **characterized by** comprising:

amemory device (12) for storing specific information (Db1, Db2) for causing a predetermined variation to occur in game contents;
 an execution device (10a) for executing the game making use of the specific information (Db1, Db2);
 a summing-up management device (10b) for digitizing, each time the game is played in a predetermined play range, a result of the game in the play range according to a predetermined rule and summing up the digitized numerical values over a plurality of play ranges; and
 an execution control device (10c) for managing a prohibited state of use of the specific information (Db1, Db2) by the execution device (10a) and managing removal of the prohibited state, based on the value (Pa) summed up by the summing-up management device (10b).

2. The game machine (1) according to claim 1, **characterized in that** the memory device (12) stores a plurality of types of the specific information (Db1, Db2), and the execution control device (10c) removes the prohibited state of each type of the specific information (Db1, Db2) separately each time the summed-up value (Pa) reaches a predetermined target value (Po).

3. The game machine (1) according to claim 2, **characterized in that** the execution control device (10c) removes the prohibited state of the respective types of the specific information (Db1, Db2) in a predetermined order.

4. The game machine (1) according to claim 3, **characterized in that** the execution control device (10c) changes the order in which the prohibited state of the specific information (Db1, Db2) is removed based on time interval at which the prohibited state is removed.

5. The game machine (1) according to claim 4, **characterized in that** when the time interval at which the prohibited state is removed is shorter than a predetermined reference value, the execution control device (10c) suspends removal of the prohibited state of the specific information to come next and moves up removal of the prohibited state of the spe-

cific information which is to come later than the specific information to come next so as to realize the change of the order.

6. The game machine (1) according to claim 5, **characterized in that** the execution control device (10c) sequentially removes the prohibited state of the specific information (Db1, Db2) whose removal has been suspended based on the summed-up value (Pa) and the target value (Po) after removing the prohibited state of the specific information whose order is set to a final order.

7. The game machine (1) according to claim 6, **characterized in that** the execution control device (10c) sets the target value (Po) to remove the prohibited state of the specific information (Db1, Db2) whose removal has been suspended to a value larger than an original target value which is set to remove the prohibited state of the same specific information is removed without the suspension.

8. The game machine (1) according to claim 7, **characterized in that** the execution control device (10c) further comprises a number of suspended times count device for counting the number of suspending the removal of prohibited state and a bonus application device for creating an extra bonus in the game contents when the number of suspension reaches at least a predetermined value.

9. The game machine (1) according to claim 3, **characterized in that** the execution control device (10c) changes the target value (Po) based on the time interval at which the prohibited state is removed.

10. The game machine (1) according to claim 9, **characterized in that** the execution control device (10c) reduces the target value (Po) when time interval from time at which the prohibited state of a piece of specific information (Db1) is removed to time at which the prohibited state of a next piece of specific information (Db2) is removed is equal to or larger than a predetermined value.

11. The game machine (1) according to any one of claims 1 to 10, **characterized in that** the execution device (10a) can execute a game by classifying a degree of difficulty into a plurality of levels, and the summing-up management device (10b) evaluates the results of the game by individually classifying the results into predetermined steps in each difficulty level and digitizes the steps of evaluation based on a rule common to the respective difficulty levels.

12. The game machine (1) according to any one of claims 1 to 10, **characterized in that**:

the execution device (10a) can execute the game with guiding a series of operations for an input unit (13) to a player as well as with evaluating a degree of agreement between an operation guided by the execution device (10a) and an operation actually executed by the player as to each operation included in the series of the operations; and
 the summing-up management device (10b) digitizes the results of the game based on the ratio of the number of operations which get evaluation equal to or higher than a predetermined level of the respective operations to the total number of operations included in the series of the operations.

13. The game machine (1) according to claim 12, **characterized in that** the execution device (10a) can execute the game with changing the degree of difficulty by changing the total number of operations to be guided.

14. The game machine (1) according to any one of claims 1 to 13, **characterized in that** the play range is set in exchange for consumption of a predetermined economic value.

15. A game program **characterized by** being arranged to cause a game machine (1) as a computer arranged on the assumption that unspecified number of players play a game to function as:

a memory device (12) for storing specific information (Db1, Db2) for causing a predetermined variation to occur in game contents;
 an execution device (10a) for executing the game making use of the specific information (Db1, Db2);
 a summing-up management device (10b) for digitizing, each time the game is played in a predetermined play range, a result of the game in the play range according to a predetermined rule and summing up resultant numerical values over a plurality of play ranges; and
 an execution control device (10c) for managing a prohibited state of use of the specific information (Db1, Db2) used by the execution device (10a) and managing removal of the prohibited state, based on the value summed up by the summing-up management device (10b).

16. A game machine (1) arranged on the assumption that unspecified number of players play a game with the game machine **characterized by** comprising:

a memory device (12) for storing a plurality of types of specific information (Db1, Db2) for causing a predetermined variation to occur in

game contents;
 an execution device (10a) for executing the game making use of the specific information (Db1, Db2); and
 an execution control device (10c) for sequentially removing a prohibited state of the plurality of types of the specific information (Db1, Db2) each time a predetermined removal condition relating to an operational status of the game machine is satisfied,

wherein when a predetermined order change condition relating to the operational status is not satisfied, the execution control device (10c) removes the prohibited state in a predetermined order, whereas when the predetermined order change condition is satisfied, the execution control device (10c) changes the order in which the prohibited state is removed from the predetermined order.

17. The game machine (1) according to claim 16, **characterized in that** the execution control device (10c) changes the order in which the prohibited state of the specific information (Db1, Db2) is removed based on time interval at which the removal condition is satisfied.

18. The game machine (1) according to claim 16 or 17, **characterized in that** the execution control device (10c) determines whether or not the removal condition or the change condition is satisfied in relation to at least any one of the number of times the game is played in a predetermined play range, a period of time during which the game is played in the play range, and scores given to the play in the play range.

19. The game machine (1) according to any one of claims 16 to 18, **characterized in that** when the time interval at which the removal condition is satisfied is shorter than a predetermined reference value, the execution control device (10a) suspends removal of the prohibited state of the specific information to come next and moves up removal of the prohibited state of the specific information which is to come later than the specific information to come next so as to realize the change of the order.

20. The game machine (1) according to claim 19, **characterized in that** the execution control device (10c) removes the prohibited state of the specific information (Db1, Db2) whose removal has been suspended based on whether or not the removal condition is satisfied after the execution control device (10c) removes the prohibited state of the specific information (Db1, Db2) whose order is set to a final order.

21. The game machine (1) according to claim 20, **char-**

acterized in that the execution control device (10c) sets the removal condition, used to remove the prohibited state of the specific information whose removal has been suspended, more strictly than an original removal condition which is set to remove the prohibited state of the same specific information without the suspension. 5

22. The game machine (1) according to claim 21, **characterized in that** the execution control device (10c) further comprises a number of suspended times count device for counting the number of suspending the removal of prohibited state and a bonus application device for creating an extra bonus in the game contents when the number of suspension reaches at least a predetermined value. 10 15

23. The game machine (1) according to claim 16, **characterized in that** the execution control device (10c) changes the removal condition based on the time interval at which the prohibited state is removed. 20

24. The game machine (1) according to claim 23, **characterized in that** the execution control device (10c) eases the removal condition when a time interval from time at which the prohibited state of a piece of specific information is removed to time at which the prohibited state of a next piece of specific information is removed is equal to or larger than a predetermined value. 25 30

25. A game program **characterized by** being arranged to cause a game machine (1) as a computer arranged on the assumption that unspecified number of players play a game to function as: 35

a memory device (12) for storing a plurality of types of specific information (Db1, Db2) for causing a predetermined variation to occur in game contents; 40

an execution device (10a) for executing the game making use of the specific information (Db1, db2); and

an execution control device (10c) for sequentially removing a prohibited state of the plurality of types of the specific information (Db1, Db2) each time a predetermined removal condition relating to an operational status of the game machine is satisfied, 45 50

wherein when a predetermined order change condition relating to the operational status is not satisfied, the execution control device (10c) removes the prohibited state in a predetermined order, whereas when the order change condition is satisfied, the execution control device (10c) changes the order in which the prohibited state is removed from the predetermined order. 55

FIG. 1

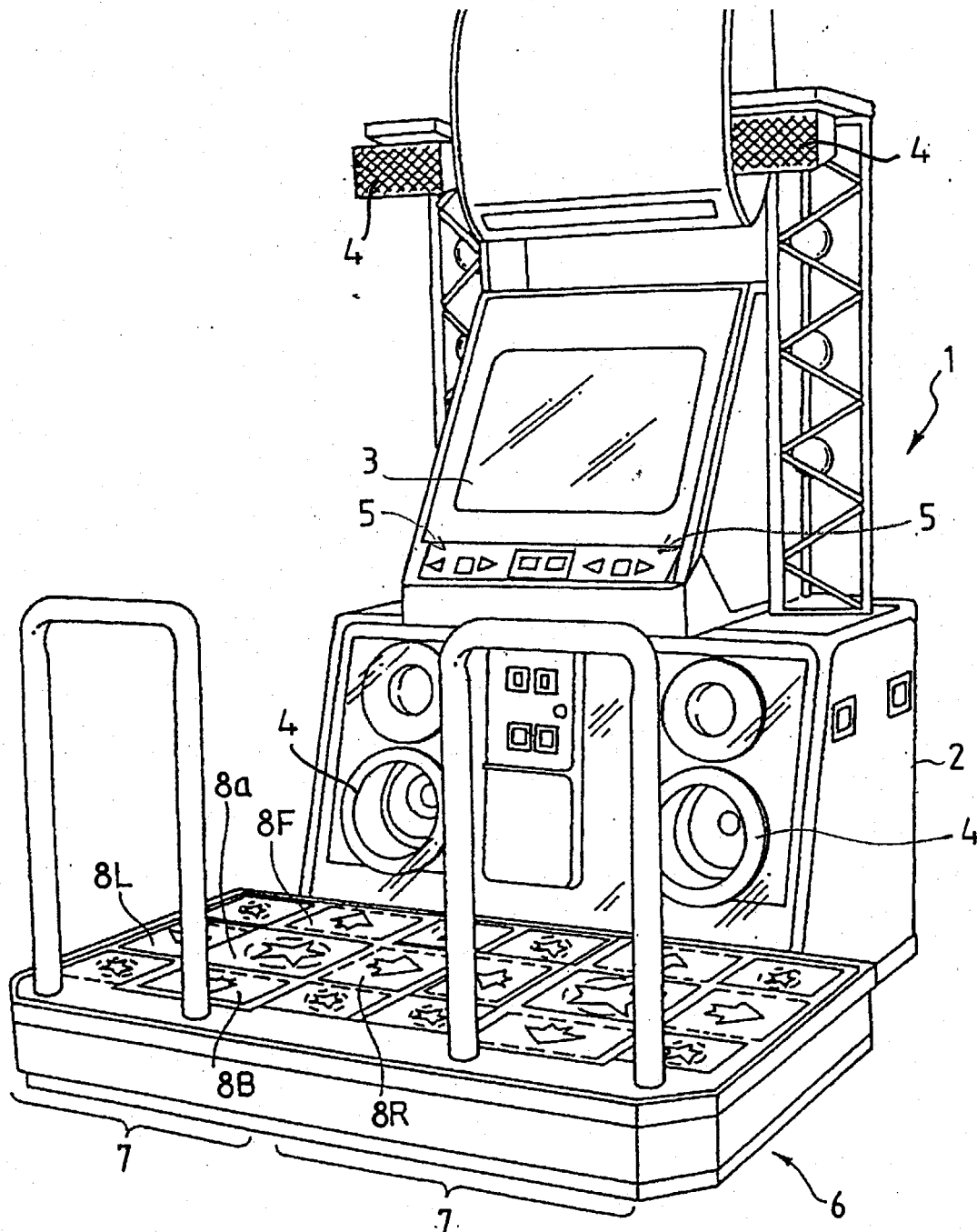
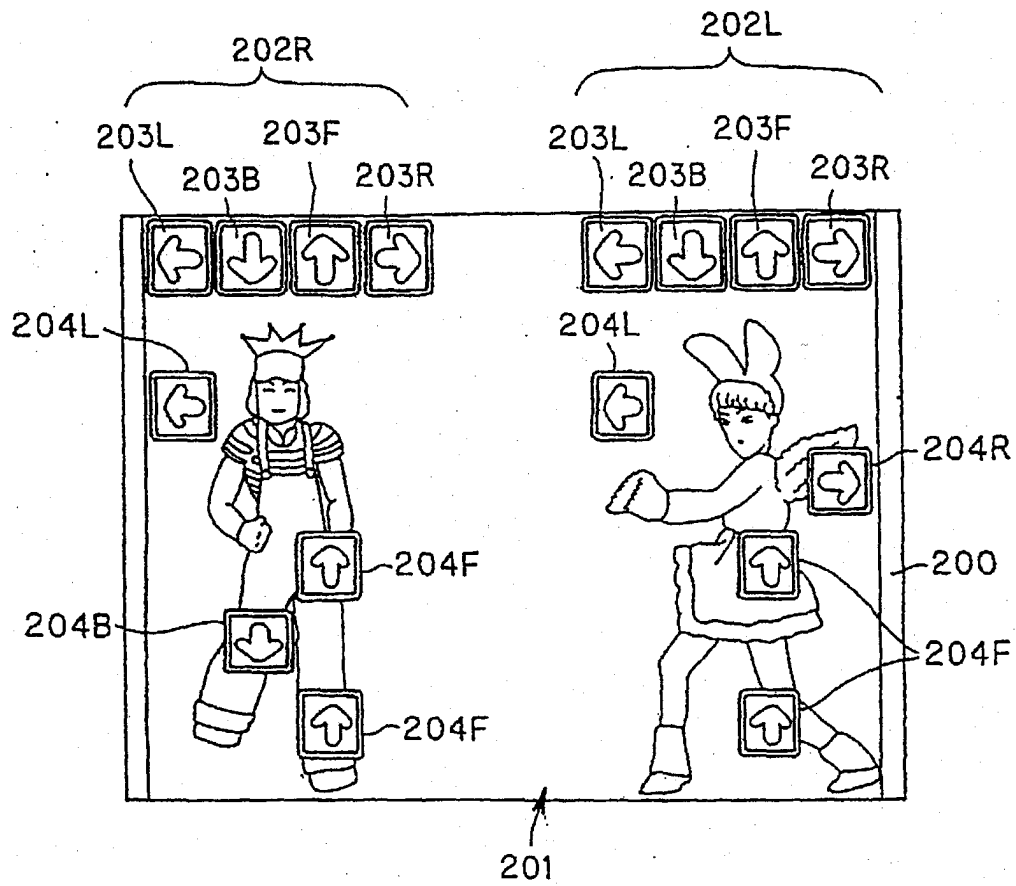


FIG. 2



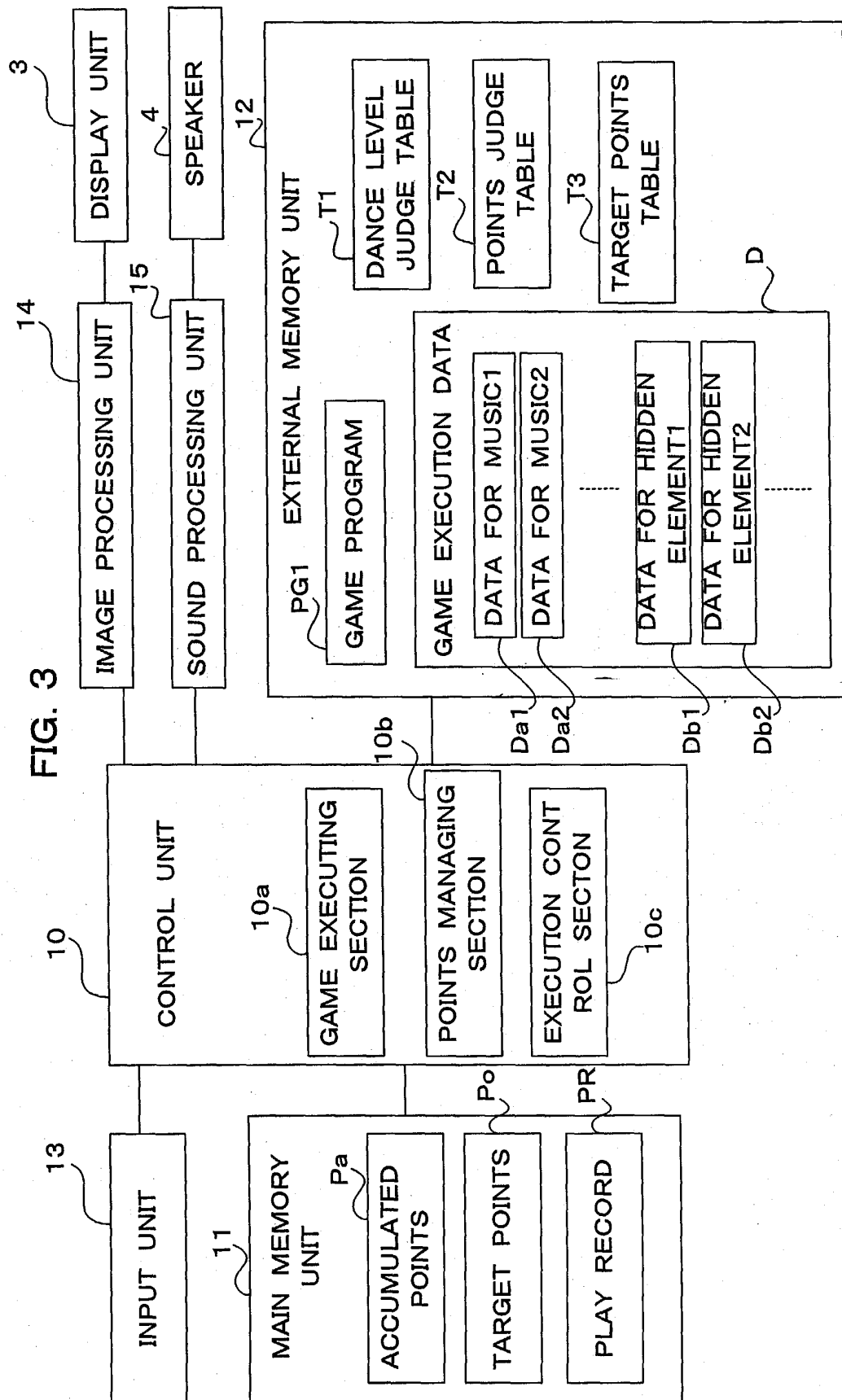


FIG. 4

DANCE LEVEL	RATIO
AAA	99%
AA	95%
A	90%
B	70%
C	50%
D	25%
E	0%

FIG. 5

DANCE LEVEL	POINTS
AAA	10
AA	1
A	1
B	1
C	1
D	0
E	0

FIG. 6

STAGE	DANCE LEVEL
FIRST MUSIC	A
SECOND MUSIC	D
THIRD MUSIC	C
FOURTH MUSIC	AAA
FIFTH MUSIC	AA

FIG. 7

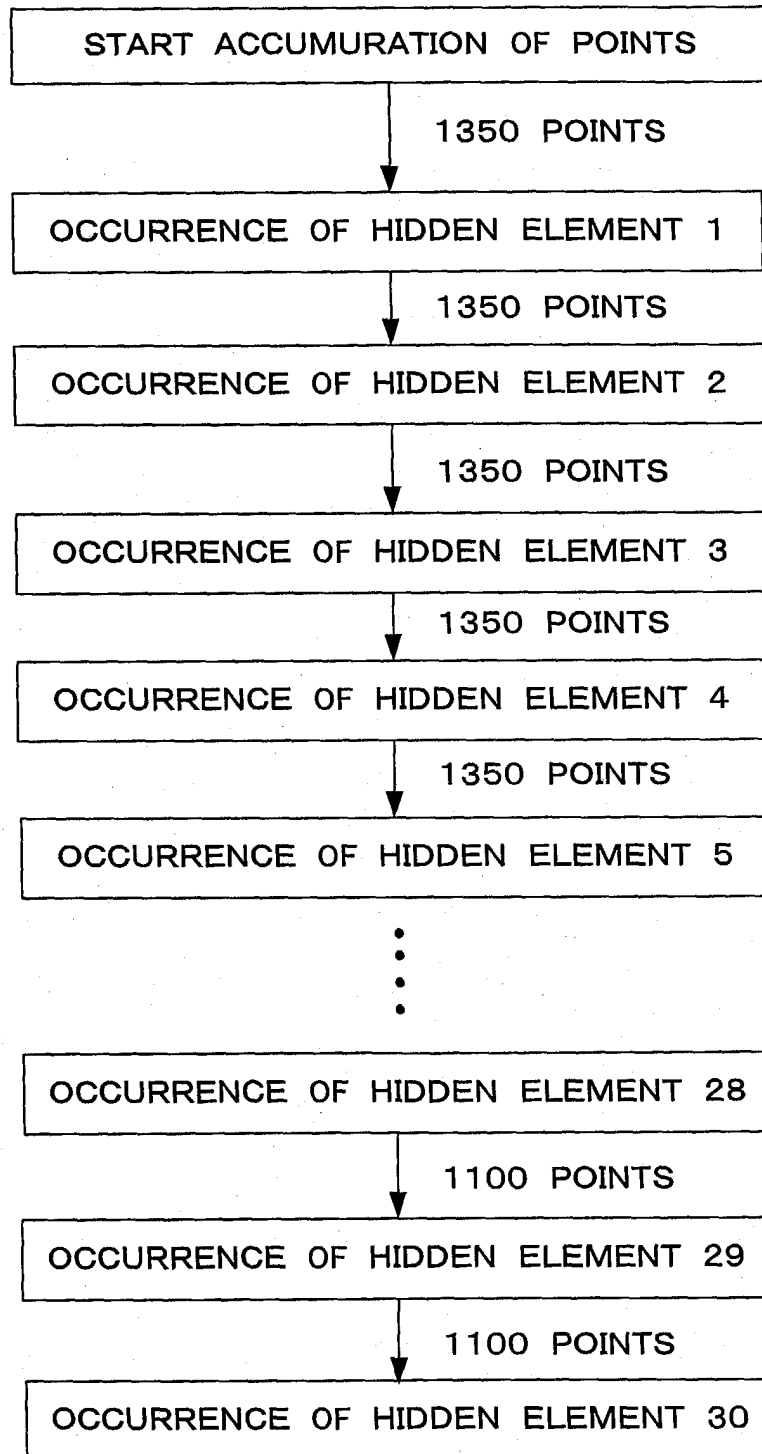


FIG. 8

HIDDEN ELEMENT	TARGET POINTS
HIDDEN ELEMENT 1	1350
HIDDEN ELEMENT 2	1350
HIDDEN ELEMENT 3	1350
...	...
...	...
HIDDEN ELEMENT 29	1100
HIDDEN ELEMENT 30	1100

FIG. 9

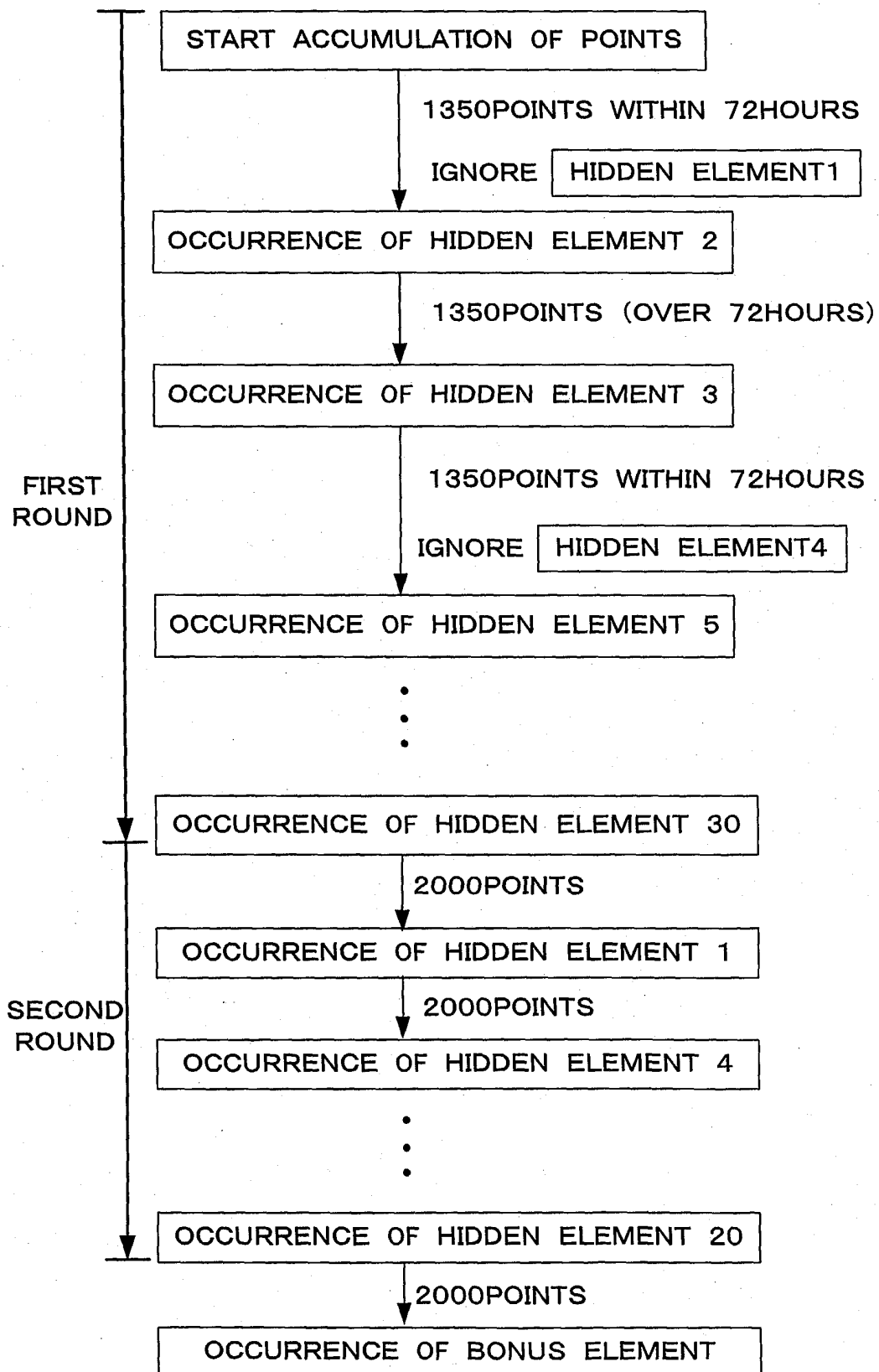


FIG. 10

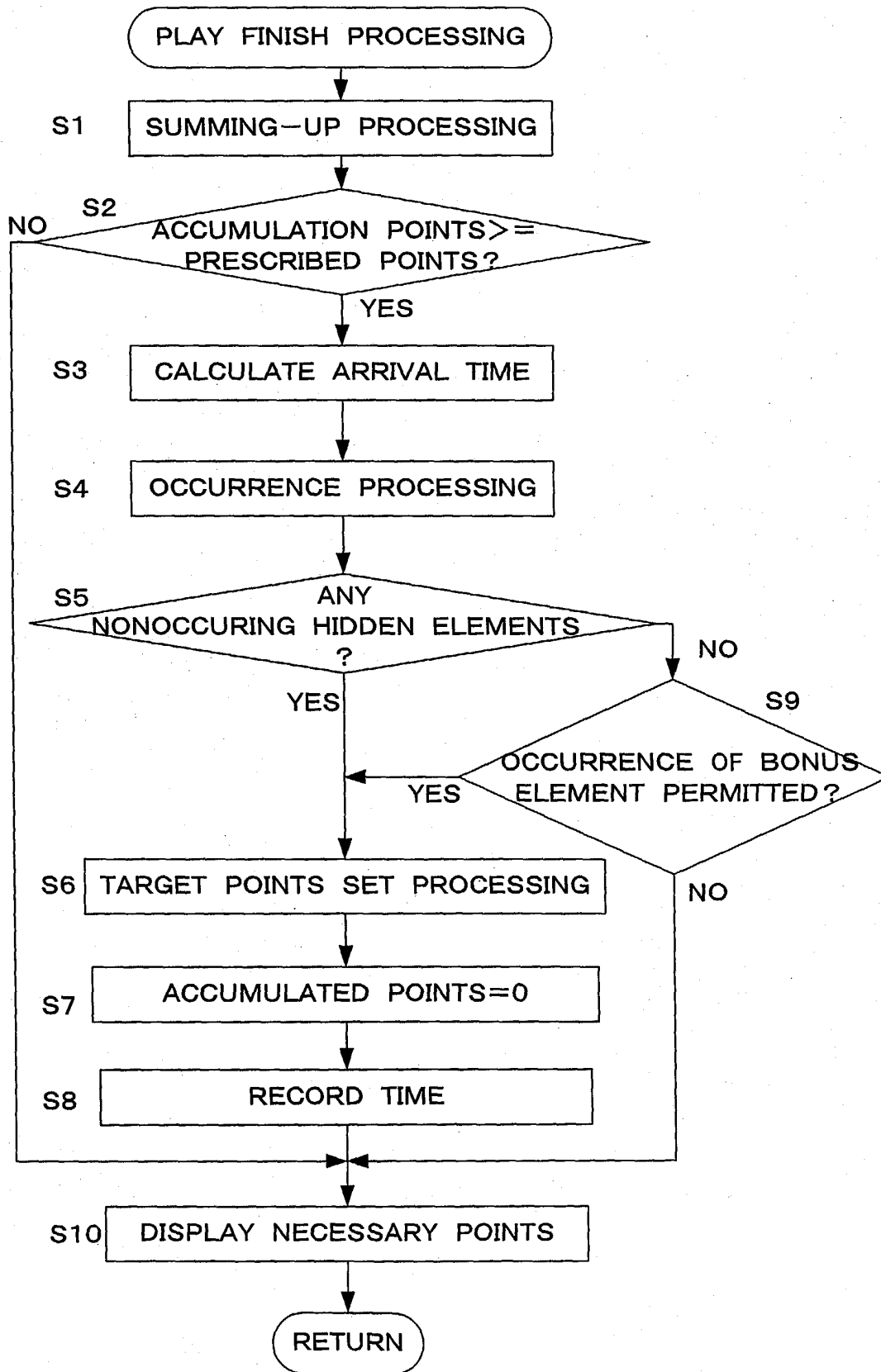


FIG. 11

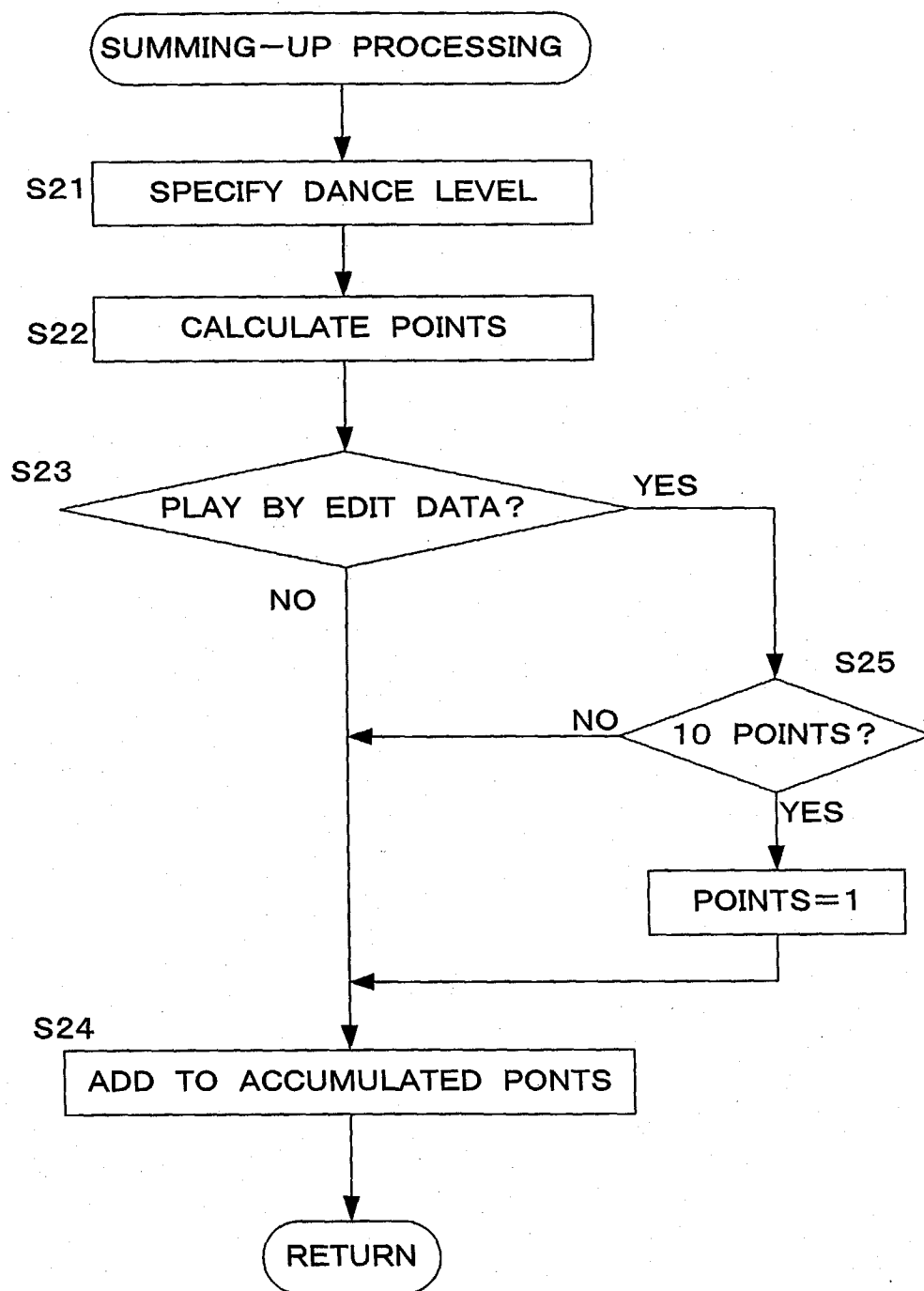


FIG. 12

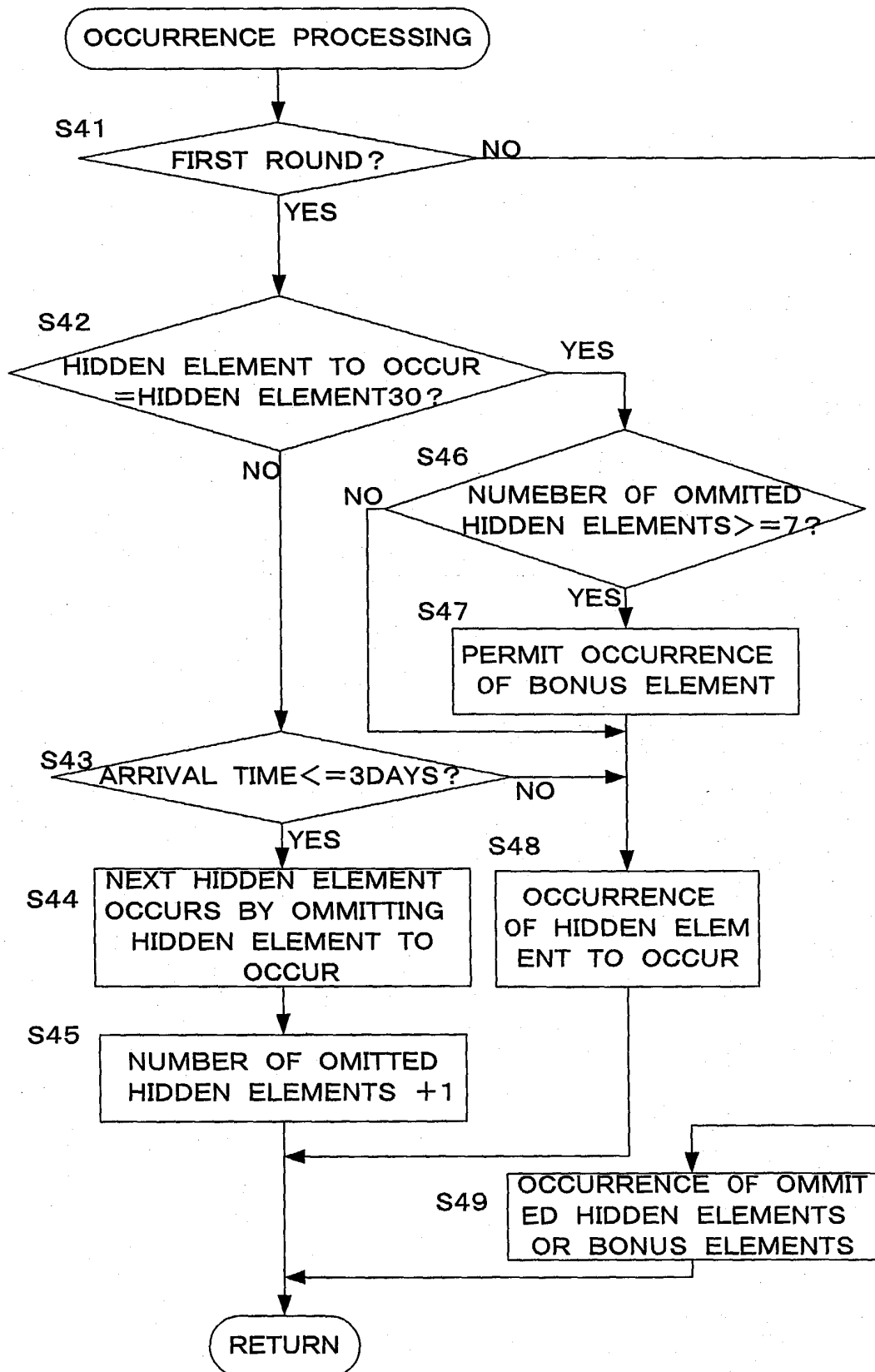


FIG. 13

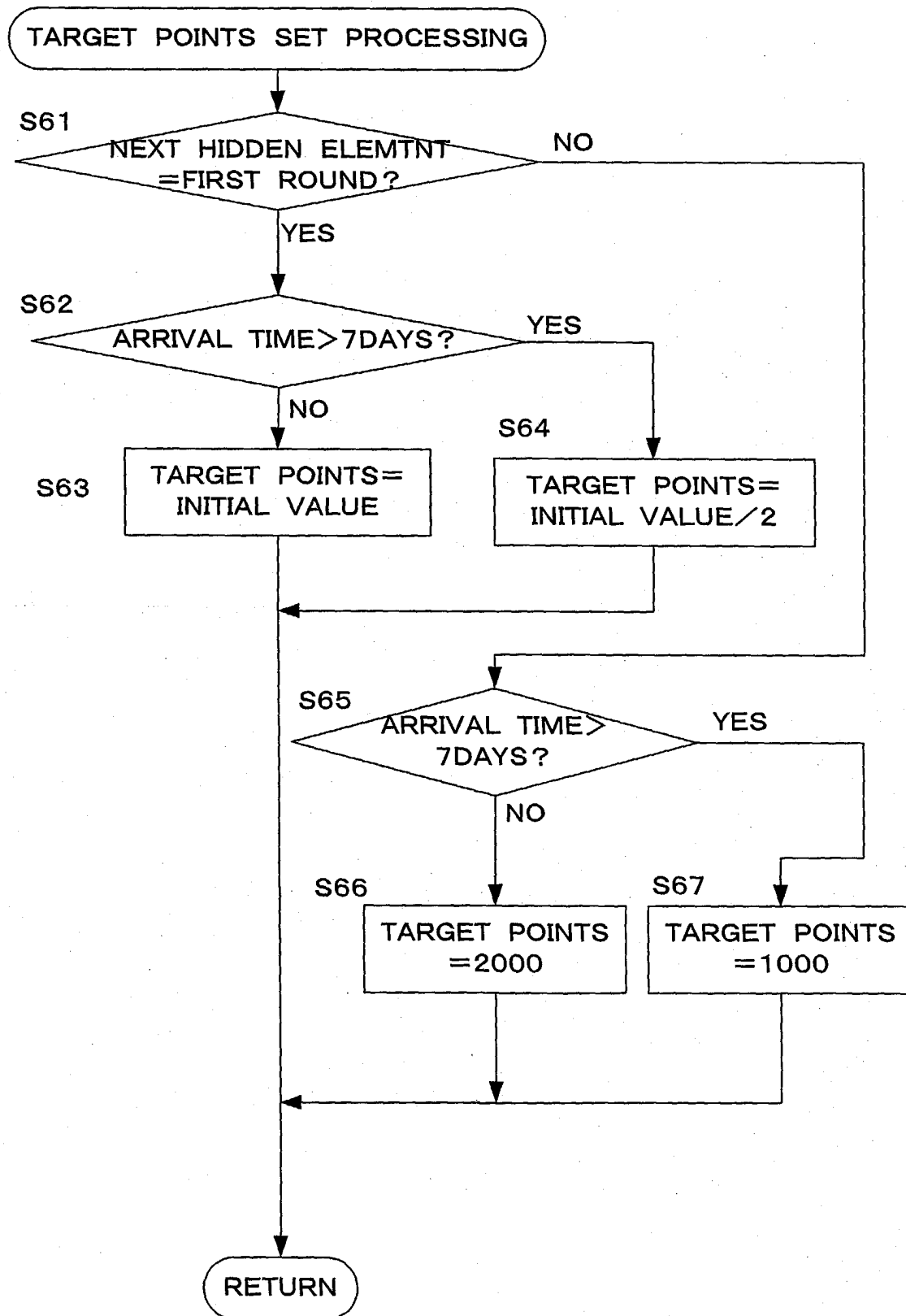


FIG.14

UNTIL HIDDEN ELEMENT OCCURS
NEEDED

2073

POINTS