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⑴ Game toy.

⑷ A game toy is disclosed which comprises a bar code reading device which reads bar codes from a card CD on which data relating to the game has been recorded in the bar codes; a data arrangement device which adds arbitrary data to data which is read by the bar code reading device to arrange it into a specific amount of data, when the data is below a predetermined amount; and a winner determining device which determines the winner and loser based on the data which is read by the above mentioned bar code reading device, or on the data which is arranged into the above mentioned specific amount of data.

The game toy brings an element of surprise and a high level of interest to the game even when the amount of data obtained from the card is small, because the data is arranged into a specific amount.

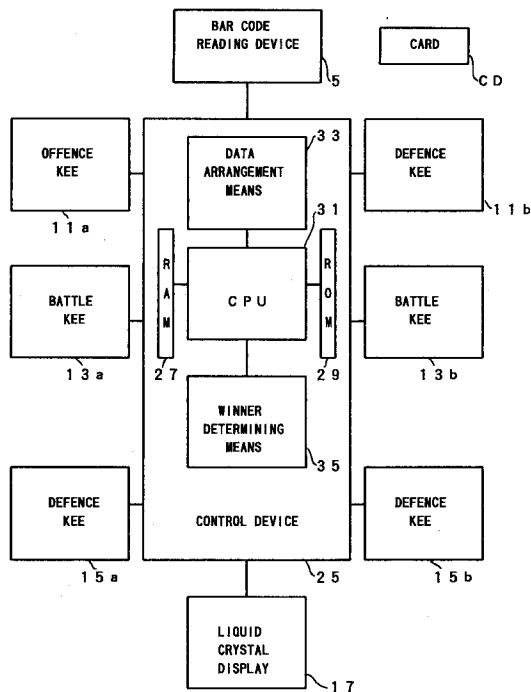


FIG. 1

FIELD OF THE INVENTION

The present invention relates to a game toy with which a game is played by reading optical identification codes from a recording medium.

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DESCRIPTION OF THE PRIOR ART

A great variety of game toys have been heretofore proposed, with which a game is played by reading optical identification codes arranged on a card.

For optical identification codes on the above mentioned card, bar codes for example, are used, which contain printed data relating to the game, and a predetermined amount of data is arranged depending on a specific number of printed bar codes. Therefore, when the bar codes on a card are read using an optical reading device, a predetermined amount of data is provided for each of the cards. The player may then engage in a competition, etc. based on the predetermined amount of data obtained from each card.

However, in cases where the amount of bar code data obtained from the card does not reach a specific amount, a reading failure of the bar codes results in which the data is not received as normal data, and the game cannot proceed beyond that point. In such cases, it is necessary to perform a re-reading operation in order to cause the bar codes on the card to be read correctly.

Also, since there is a 1 to 1 correspondence between the bar codes arranged on the card and the data content which depends on said bar codes, the data content recorded in each of the cards is fixed. As a result, one of the defects of the game is that it contains no element of surprise, causing a subsequent loss of interest each time the game is played, and the player soon tires of it.

BRIEF SUMMARY OF THE INVENTION

The present invention was developed in light of the subject described above. Its purpose is to provide a game toy which arranges data into a specific amount even when the amount of data obtained from the card is small, thus offering an element of surprise in order to maintain a high level of interest.

The means provided by the present invention for the above stated purpose has been constructed to include the requisites listed below; that is,

- (1) reading means for reading optical identification codes from a recording medium on which the data of the game is stored based on said optical identification codes;
- (2) data arrangement means which adds arbitrary data to data read according to the above

mentioned reading means, to arrange a specific amount of data when the amount of said read data is below a predetermined amount; and
 (3) winner determining means which determines the winner and loser based on the data which is read by the above reading means, or based on the data which is arranged into said specific amount of data.

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BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram showing the configuration of a circuit inside a game toy frame, and its periphery, according to the present invention.

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Fig. 2 is a plane view of a game toy frame according to the present invention.

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Fig. 3 is a flow chart showing the basic operational control of a competitive game which utilizes a game toy according to the present invention.

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Fig. 4 is a flow chart showing the function of a bar code reading device where the amount of data read is below a predetermined amount.

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DETAILED DESCRIPTION OF THE INVENTION

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The means provided by the present invention adds arbitrary data to data read according to a reading means, and arranges it into a specific amount of data when the amount of said read data is below a predetermined amount. The winner is decided based on the data which is read by this reading means, or based on the data which is arranged into said specific amount of data.

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Therefore, even when the amount of data obtained from the card is small, since arbitrary data is added and arranged into a specific amount of data, an element of surprise becomes possible in the course of the game, and a game toy with a high level of interest is obtained.

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An explanation will now be made of an example of the present invention, with reference to the drawings.

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EXAMPLE

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First, an explanation will be made of the general configuration of game toy 1, with reference to Fig. 2.

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Game toy 1 is comprised of a game toy frame 3 and various card CD's which are the recording media which record data relating to the game in optical identification codes. Data relating to the game is recorded on these various card CD's, in bar codes. A bar code reading device 5 is constructed on the top side of the game toy frame 3. This bar code reading device 5 is the reading means for reading the bar codes from the recording medium. That is, an insert slot 7 for inserting

the card CD and a groove 9 connected to this insert slot 7 are constructed in the bar code reading device 5, and when the card CD which is inserted through the insert slot 7 is moved along the groove 9, the bar codes arranged on said card CD are optically read. Also, on the right and left sides of the game toy frame 3, various operating keys are constructed. That is, on the left side of the game toy frame 3 there are constructed an offence key 11a, a battle key 13a, and a defence key 15a for operation by one player; and on the right side of the game toy frame 3 there are constructed an offence key 11b, a battle key 13b and a defence key 15b for operation by the other player. In the center of the game toy frame 3 there is constructed a liquid crystal display 17 for displaying the images and various information relating to the game. Also, on the bottom side of the game toy frame 3 there are constructed a power switch 19, a sound switch 21 and a mode change switch 23. Various circuits are built into the interior of the game toy frame 3.

Next, an explanation will be made of the configuration of the circuits to be built into the interior of the game toy frame 3 and of their periphery, with reference to Fig. 1.

The bar code reading device 5 which optically reads bar codes arranged on the card CD is connected to a control device 25, and outputs the data which is read by the bar code reading device 5 to the control device 25. This control device 25 includes a RAM 27 which temporarily stores the above mentioned read data, a ROM 29 in which the basic program of the game has been stored, and a CPU 31 for executing the various control processes necessary for the proceeding of the game, etc. Also, the control device 25 includes a data arrangement means 33 which adds arbitrary data to said read data and arranges it into a specific amount of data, when the amount of data which is read by the bar code reading device 5 is below a predetermined amount; as well as a winner determining means 35 which determines the winner based on the data which is read by the above mentioned bar code reading device 5 or based on the data which is arranged into the above mentioned specific amount of data. Also, the offence keys 11a and 11b, the battle keys 13a and 13b, the defence keys 15a and 15b and the liquid crystal display 17 are each connected to the control device 25. The control device 25 advances the progress of the game in response to the action of the various operation keys mentioned above, and displays the results on the liquid crystal display 17.

Next, an explanation will be made of the basic actions made in a competitive game using the game toy 1, with reference to Fig. 3. Here, the explanation concerns the function in a case where

the data which is read by the bar code reading device 5 attains a predetermined amount.

First, in step S1, the bar code reading device 5 reads the bar codes of the card CD. The data which is read from this card CD is recorded in a certain area of the RAM 27. In step S3, it is determined whether the reading of the bar codes from the card CD has been completed or not. If it is determined in step S3 that the reading of the bar codes has not been completed, the flow returns again to step S1. If the reading of the bar codes from the card CD has been completed in step S3, the flow proceeds to step S5 which judges which is the first or the second player.

Then, in step S7, it is determined whether the first player's offence key has been pressed, and if the first player's offence key has been pressed the flow proceeds to step S9 where the ratio of hits is checked. If the first player's offence key has not been pressed in step S7, the flow proceeds to step S11 where it is determined whether the first player's defence key has been pressed or not. If the first player's defence key has not been pressed in S11 the the flow returns again to step S7. If the first player's defence key has been pressed in step S11 then the flow proceeds to step S13 where calculation is made of the power level recovered.

Next, in step S15, it is determined whether the second player's offence key has been pressed, and if the second player's offence key has been pressed, the flow proceeds to step S19 where the ratio of hits is checked. On the other hand, if the second player's offence key has not been pressed in step S15, the flow proceeds to step S19 where it is determined whether the second player's defence key has been pressed or not. If the second player's defence key has not been pressed in S19 the the flow returns again to step S15. On the other hand, if the second player's defence key has been pressed in step S19 then the flow proceeds to step S21 where calculation is made of the power level recovered.

Then, in step 23, it is determined whether the battle key has been pressed or not. If the battle key has been pressed, the flow proceeds to steps S25 and S27, the damage to each player is calculated, and the result is displayed on the liquid crystal display 17. In step S29, it is determined whether the power level HP of either one of the competitors is zero, and if neither of the power level HP is zero, the flow proceeds once again to step S5, and the competition continues as described above. If it is determined in step S29 that the power level HP of either one of the competitors is zero, then the flow proceeds to step S31 and processing is executed to end the game. For example, it is judged that the competitor whose power level HP was zero is the loser, and this is

displayed on the liquid crystal display 17.

Next, an explanation will be made concerning the function in a case where the amount of data which is read by the bar code reading device 5 is below a predetermined amount, with reference to Fig. 4.

When, for example, only one portion of all the bar codes which are arranged on the card is read, and the card is pulled out during processing shown in steps S1 and S3 of the above described Fig. 3, it is determined that the amount of data is below a predetermined amount, and processing is executed as shown in Fig. 4.

First, in step S41, a copy source address is set. That is, the data which is read from the card CD is sequentially recorded in the RAM 27, but when the data which is read is below a predetermined amount, the data address already recorded in this RAM 27 is set as the address for the above mentioned copy source.

Next, in step S43, the copy destination address is set. That is, the data which is read from the card CD is sequentially recorded in a certain area of the RAM 27, but when the amount of data which is read is below a predetermined amount, a free area is given, and the address of this free area is set as the above mentioned copy destination address.

In step S45, the work area for data copying is cleared. Then in step S47, the data which is recorded at the above mentioned copy source address is retrieved. In step S49, the work area for data copying is incremented by only +1.

In step 51, it is determined whether the copy source data is a logic 1 or not, and if the copy source data is a logic 1, then the flow proceeds to step S53 where it is determined whether the work area for data copying is an odd number or not. If the work area for data copying is not an odd number in step S53, then the flow proceeds to step S55 where a logic 1 is copied to the copy destination address. On the other hand, if the work area for data copying is an odd number in step S53, the flow proceeds to step S59 where a logic 0 is copied to the copy destination address.

When it is determined in step S51 that the copy source data is not a logic 1, then the flow proceeds to step S57 where it is determined whether the work area for data copying is an odd number or not. If the work area for data copying is not an odd number in step S57, then the flow proceeds to step S59 where a logic 0 is copied to the copy destination address. On the other hand, if the work area for data copying is an odd number in step S57, then the flow proceeds to step S55 where a logic 1 is copied to the copy destination address.

In step S61, the copy source address is incremented by only +2. Further, in step S63 the copy

destination address is incremented by only +1. Then, in step S65, it is determined whether the the copy destination address is the final address or not, and if the copy destination address is not the final address, the flow returns again to step S47 where the above described process is repeated. That is, the data which is recorded in every other address of the data which is recorded in the copy source area is sequentially recorded to the copy destination address.

In light of the above, when the amount of data read by the bar code reading device 5 is below a predetermined amount, it is arranged into a specific amount of data through copying of the source data, and therefore it is possible to have an element of surprise in the data content.

Also, even when, for example, only one portion of all the bar codes which are arranged on the card is read, and the card is pulled out during processing, since arbitrary data is added in response to the amount of the missing data to arrange a specific amount of data, a completely separate data content can be obtained even when using an identical card.

Here, in the example described above, the data was copied and arranged into a certain amount of data, by sequentially recording the data which is recorded in every other address of the data recorded in the copy source to the copy destination address. However, the present invention is not limited to this, as it is possible to use any other suitable means for copying data. For example, it may be configured so that data which is recorded at a suitable address from the data which is stored in the copy source area is recorded at a sequential copy destination address.

Also, the copy data may be prepared in advance, and configured so that when the data which is read by the bar code reading device 5 is below a predetermined amount, the pre-prepared data is added to provide a specific amount of data.

Also, in the above mentioned example, configuration was done using bar codes as the optical identification codes, but the present invention is not limited to this. For example, configuration may be done using suitable optical identification codes such as karura codes, etc.

As explained above, the present invention adds arbitrary data to data which is read by a reading means and arranges it into a specific amount of data when said read data is below a predetermined amount. Since construction is such that the winner and loser are determined based on the data which is read by this reading means or based on the data which is arranged into said specific amount of data, input errors are almost totally eliminated, and various data contents may be obtained from the same card. Thus, according to the present invention it is possible to have an element of surprise during the

course of the game, and a game toy able to maintain a high level of interest can be realized.

Claims

1. A game toy characterized by comprising the following means:
 - (1) reading means for reading optical identification codes from a recording medium on which the data of the game is stored on said optical identification codes;
 - (2) data arrangement means which adds arbitrary data to data read by the above mentioned reading means, to arrange a specific amount of data when the amount of data read is below a predetermined amount; and
 - (3) winner determining means which determines the winner and loser based on the data read by the above mentioned reading means, or based on the data arranged into said specific amount of data.

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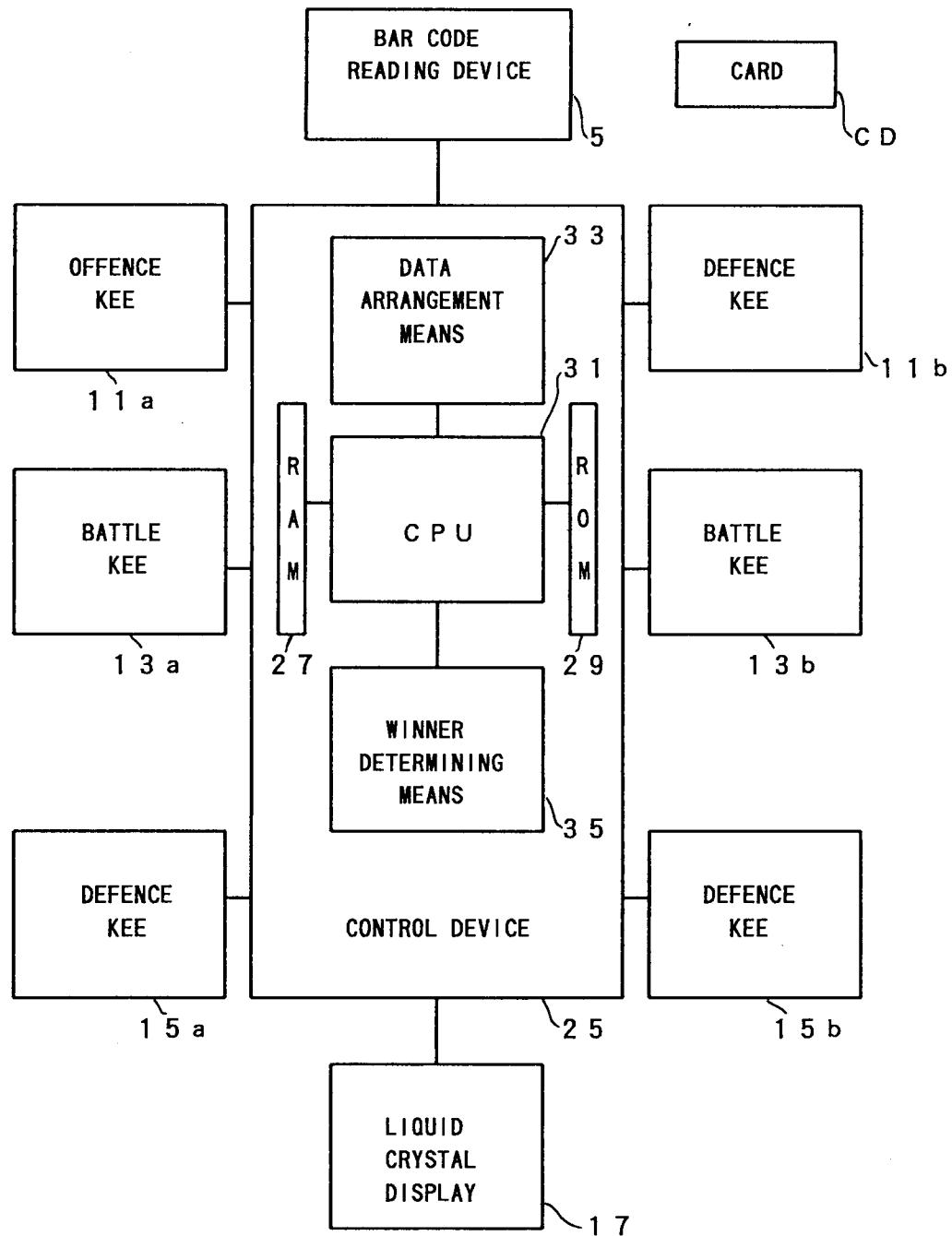
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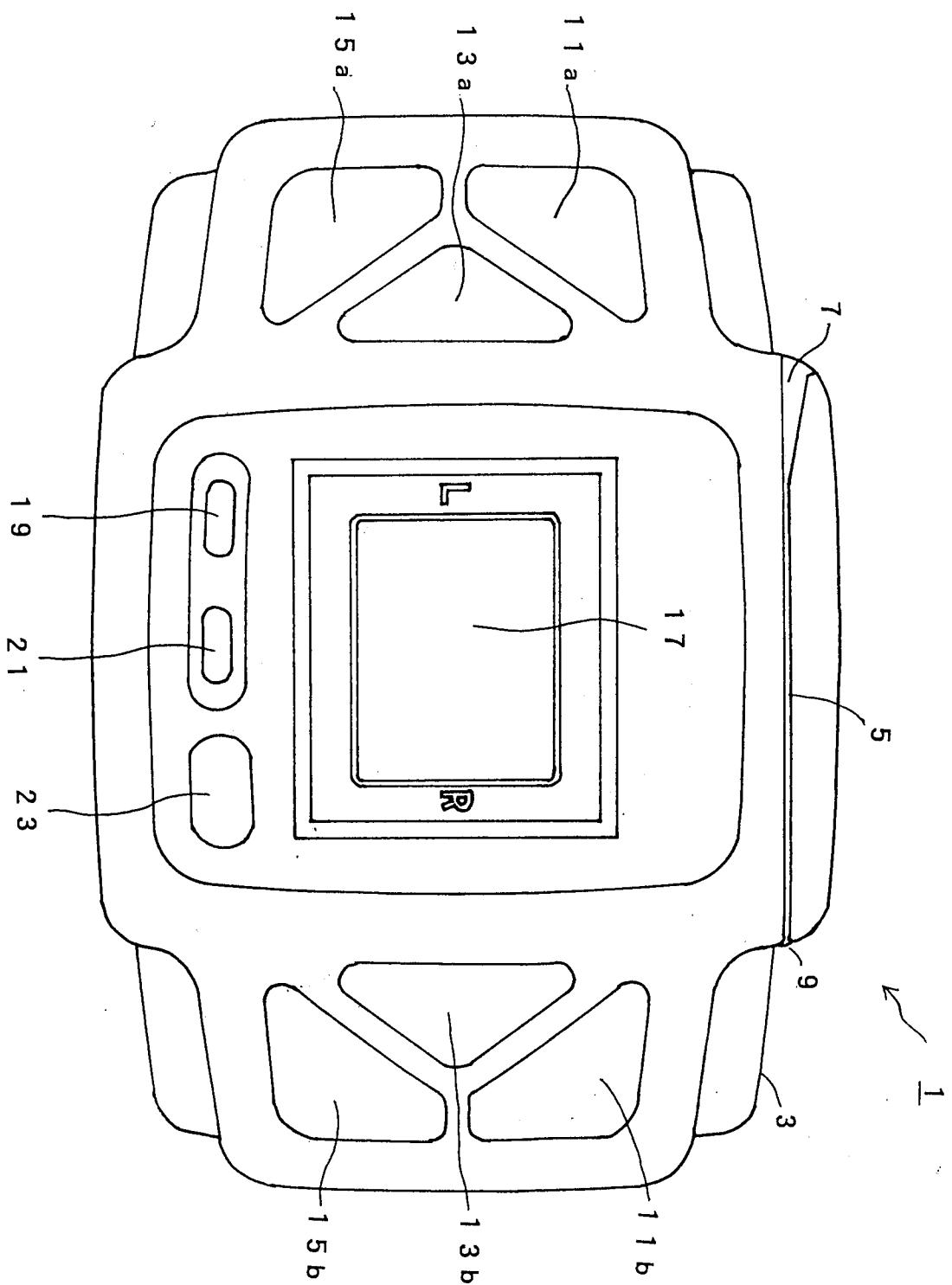
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F I G. 1



F I G. 2

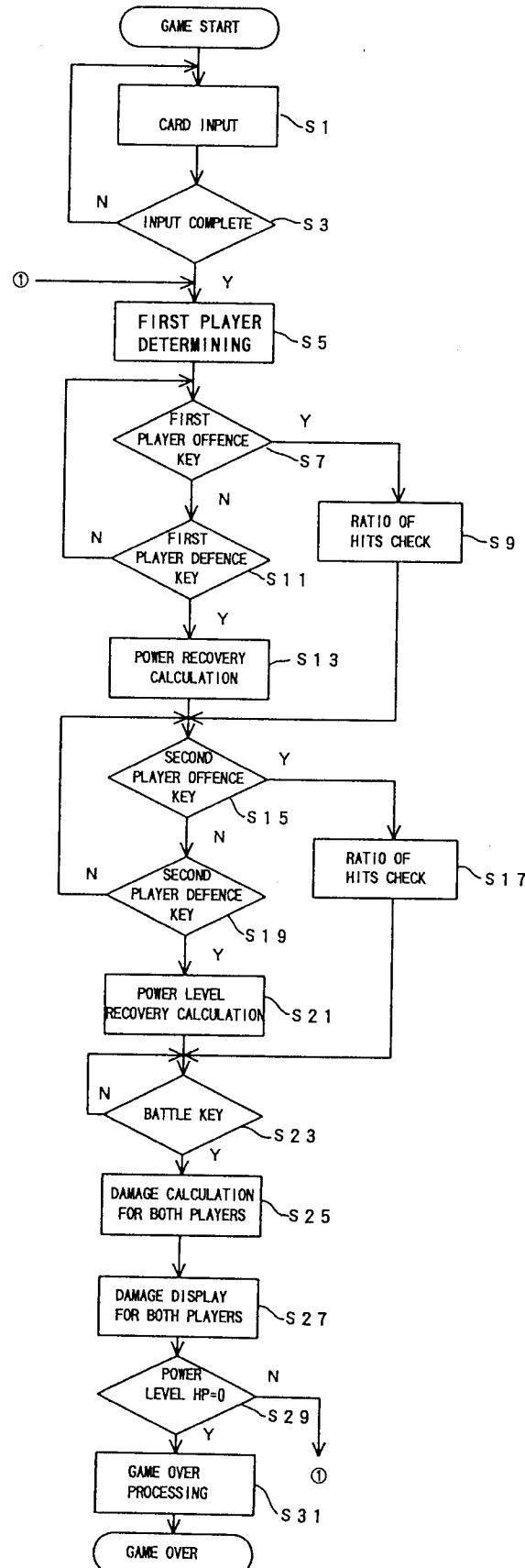
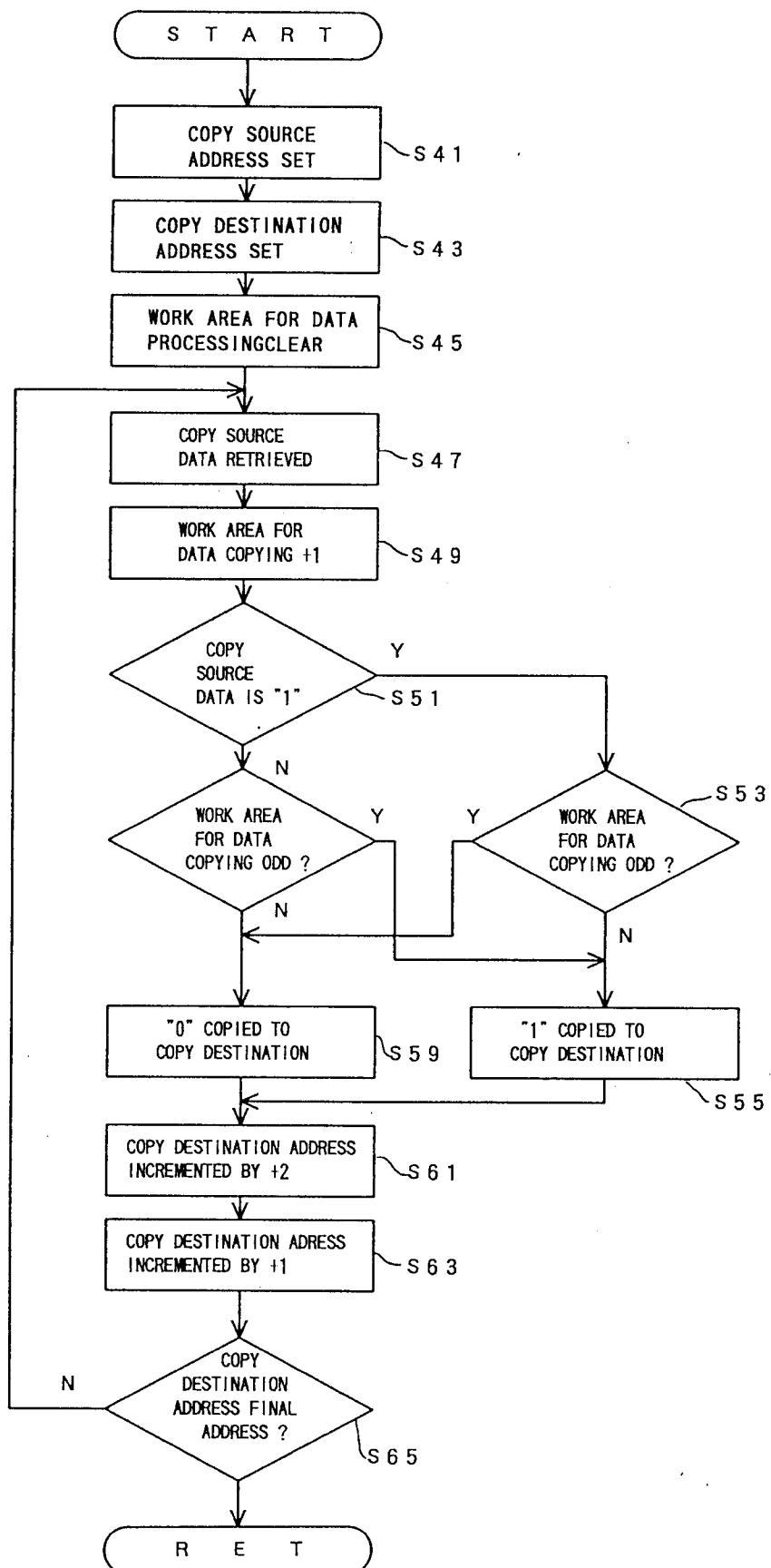


FIG. 3



F I G. 4



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

EP 92 11 4093

| DOCUMENTS CONSIDERED TO BE RELEVANT | | | |
|--|--|---|---|
| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int. Cl.5) |
| X | <p>WO-A-8 604 826 (ACORN INDUSTRIES, INC.) * page 17, line 17 - line 18; claim 1; figures 1,2 *</p> <p>-----</p> | 1 | <p>A63F3/02</p> <p>-----</p> <p>TECHNICAL FIELDS SEARCHED (Int. Cl.5)</p> <p>A63F</p> |
| <p>The present search report has been drawn up for all claims</p> | | | |
| Place of search | Date of completion of the search | | Examiner |
| THE HAGUE | 07 OCTOBER 1992 | | papa |
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