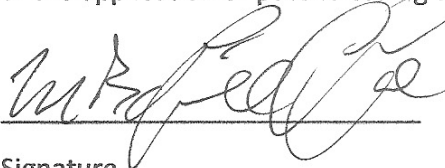


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JPH05-108505A

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A handwritten signature in cursive script, appearing to read "Michael O'Keeffe", is written over a horizontal line.

Signature

Michael O'Keeffe

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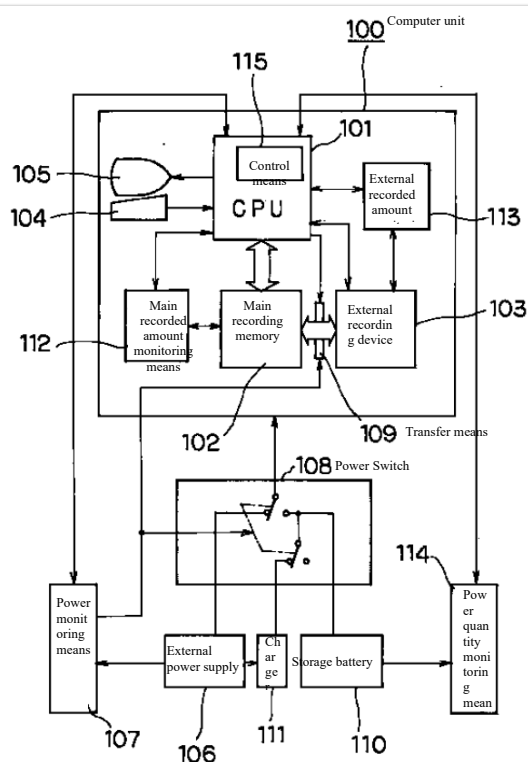
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(54) **【Title of the invention】 Computer system with memory backup guaranteed amount display function**(57) **【Summary】**

**【Objective】** To provide the computer system equipped with a memory backup function which can previously recognize whether backup can be completely executed or not, and raises an alarm when the backup can not be completely executed.

**【Configuration】** The computer system comprises a power amount monitoring means 114 that monitors the amount of power that can be supplied from the storage battery 110, a main recorded amount monitoring means 112 that measures the amount of data on the main recording memory 102, and computes the amount of memory backup possible that is the amount of data that can be transferred from the main recording memory 102 to the external recording device 103 using only the power from the storage battery 110, and a control means 115 that calculates the sum of the amount of data on the main recording memory 102 and the amount of data transferred as instructed by the data transfer instructions, and displays an alarm on the display device 105 if this sum exceeds the amount of memory backup possible.



**【Scope of Claims】**

**【Claim 1】** A computer system with a memory backup amount guaranteed function of a computer system that normally operates with power supplied from an external power supply and comprises a CPU, a volatile main recording memory, a non-volatile external recording device, a display device, an input device, a backup power supply, a power supply switching means for switching between the external power supply and the backup power supply, and a memory backup means for switching the power supply switching means to the backup power supply side when the supply voltage from the external power supply deviates from a predetermined range and transferring the memory contents of the main recording memory to the external recording device,

Wherein based on the power quantity monitoring means for monitoring the amount of power that may be supplied from the backup power supply; and

the main memory monitoring means for measuring an amount of data on the main memory; and

on the amount of power that can be supplied from the backup power source monitored by the power amount monitoring means, the amount of memory backup possible is computed, that is a data amount that can be transferred from the main recording memory to the external recording device using only power from the backup power source, and the sum of the data measured by the main memory monitoring means and the transfer data instructed by the data transfer instructions when there is a data transfer instruction from the external recording device to the main recording memory is computed, and a control means displays an alarm in the display device if the sum exceeds the amount of memory backup possible.

**【Claim 2】** A computer system with a memory backup guaranteed amount display function according to claim 1, wherein the contents of the alarm displayed by the control means to the display device is a message indicating that the alarm is an alarm, the amount of data on the main memory prior to data transfer by means of the data transfer instruction, the amount of data transferred by means of the data transfer instruction, and the amount of memory backup possible.

**【Claim 3】** A computer system with a memory backup guaranteed amount display function according to claim 1 or 2, wherein the control means displays a message in a display device with an alarm prompting input of whether or not to actually execute a data transfer instruction, and if the message is displayed in the display device, causes the data transfer based on the data transfer instruction to be temporarily suspended until there is a predetermined input in the input device.

**【Detailed description of invention】****【0001】**

**【Industrial Use Area】** The present invention relates to computer systems with memory backup functions.

**【0002】**

**【Traditional technology】** Computer systems are generally operated by power from external power sources such as commercial power sources, but if the supply of power from external power sources is interrupted due to a

power outage, data stored in the main memory in the computer system will disappear. Therefore, in order to back up the contents of the main memory, a backup power supply consisting of storage batteries, supercapacitors, lithium primary batteries, etc. is provided, and if an abnormality is detected in the supply voltage from the external power supply, the data on the main memory is urgently transferred to a non-volatile external recording device using the power supply for the backup to protect data. FIG. 2 is a block diagram illustrating a configuration of a computer system having such a memory backup function.

**【0003】** This computer system comprises, broadly, a computer unit 100 and a power supply part that supplies power to the computer unit 100. The computer unit 100 consists of a CPU (central processing unit) 101, a volatile main recording memory 102 that is directly accessed from the CPU 101, a non-volatile external recording device 103 that exchanges data with the main recording memory 102, an input device 104 such as a keyboard, a display device 105 such as CRT, and a transfer means 109 for transferring data between the main recording memory 102 and the external recording device 103. On the other hand, the power supply portion consists of an external power supply 106, such as a commercial power supply, a storage battery 110 as a backup power supply, a charger 111 for charging the storage battery 110 by power from the external power supply 106, a power supply switching switch 108, and a power supply monitoring means 107. The power switching switch 108 switches the supply of power to the computer unit 100 between the external power supply 106 and the storage battery 110 and connects the output of the charger 111 to the storage battery 110 when the computer system 100 is operating on power from the external power supply 106. In addition, the power supply monitoring means 107 constantly monitors the supply voltage of the external power supply 106, warns CPU 101 when this supply voltage deviates from a predetermined range, switches power supply switching switch 108 to the storage battery 110 side, and instructs the transfer means 109 to transfer the contents of main recording memory 102 to external recording device 103. It should be noted that a memory backup means is configured by means of the power supply monitoring means 107 and the transfer means 109.

**【0004】** With this configuration, the computer system is normally operated with power from the external power supply 106 and the battery 110 is maintained in a charged state by the charger 111. If the supply voltage of the external power supply 106 deviates from a predetermined range, the power supply monitoring means 107 immediately switches the power switching switch 108 to the storage battery 110, and this computer system is operated by power from the storage battery 110. Because there is a limited amount of charge in the storage battery 110, it is necessary to shut down the computer system, so at the same time as switching to the storage battery 110 side, the CPU 101 initiates a shutdown process effected by a warning from the power supply monitoring means 107, and the transfer means 109 initiates the transfer of the contents of the main recording memory 102 to the

external recording device 103.

**[0005]**

**[Issues that the invention seeks to solve]** In the conventional computer system with memory backup function described above, if the charged amount of the storage battery is insufficient to transfer all of the data of the main memory, there is a problem that only a portion of the data of the main memory is backed up. In addition, since the charged amount of the storage battery itself changes depending on the state of charging, the limit of the amount of data that can be backed up is not uniquely set, and it is problematic that it is only possible to know after the fact whether the backup has been performed completely.

**[0006]** The object of the present invention is to provide a computer system that can know in advance whether a backup can be performed completely, and can prevent accidents during backup by issuing an alarm when a backup cannot be performed completely.

**[0007]**

**[Means for solving the problems]** The computer system with the memory backup guaranteed amount display function of the present invention is normally powered by an external power supply and comprises; a CPU, a volatile main recording memory; and a non-volatile external recording device; a display device; and an input device; and a backup power supply; and a power switching means for switching between the external power supply and the backup power supply; and a memory backup means for switching the power supply switching means to the backup power supply side when the supply voltage from the external power supply deviates from a predetermined range to transfer recorded content of the main memory to the external recording device; a power quantity monitoring means for monitoring an amount of power that may be supplied from the backup power supply; and a main memory monitoring means for measuring an amount of data on the main memory; and based on an amount of power that may be supplied, from the backup power source monitored by the amount of power monitoring means, calculates a memory backupable amount that is a quantity of data that can be transferred from the main memory to the external recording device using only power from the backup power source; when there is a data transfer instruction from the external recording device to the main recording memory, calculating a sum of a quantity of data measured by the main memory monitoring means and the quantity of transfer data indicated by the data transfer instructions; and a control means displays an alarm in the display device if the sum exceeds the memory backup possible amount.

**[0008]**

**[Effects]** A power quantity monitoring means that monitors the amount of power that can be supplied from the power supply for backup, a main recorded amount monitoring means that measures the amount of data in the main recording memory, the amount of memory backup possible, and a control means that calculates the sum of the current data amount of the main recording memory

and the transferred data amount indicated by the data transfer instruction from the external recording device, and displays an alarm on the display device when this sum exceeds the memory backup possible amount. Therefore, an alarm is issued in advance when the data transfer from the external recording device prevents the data amount of the main memory from being fully backed up, and the operator confirms this alarm so that necessary measures can be taken to prevent backup accidents.

**[0009]** In order for the operator to take the necessary measures, it may be desirable to include at least a message indicating that the contents of the alarm displayed on the display device are an alarm, the amount of data on the main memory prior to data transfer by the data transfer instruction, the amount of transfer data instructed by the data transfer instruction, and the amount of memory backup possible. In addition, if the amount of data on the main memory exceeds the amount of memory backup possible, a message is displayed on the display device with an alarm to prompt the input of instructions as to whether or not to actually execute the data transfer instruction, and by allowing data transfer based on the data transfer instruction to be temporarily suspended until there is a predetermined input in the input device, the occurrence of the backup accident can be more completely inhibited.

**[0010]**

**[Embodiments]** The embodiments of the present invention will now be described with reference to the drawings. FIG. 1 is a block diagram illustrating a configuration of a computer system with a memory backup guaranteed amount display function in one embodiment of the present invention.

**[0011]** This computer system with a memory backup guaranteed amount display function is configured with the above-mentioned conventional computer system with a memory backup function added main memory monitoring means 112 to monitor the amount of data on the main memory and report it to the CPU 101, external recorded amount monitoring means 113 to monitor the amount of data on the external recording device and report it to the CPU 101, power monitoring means 114 to monitor the current charge amount of the storage battery 110 and report it to the CPU 101, and control means 115 provided in the CPU 101. The main memory monitoring means 112 and the External recorded amount monitoring means 113 are provided in the computer unit 100. The control means 115 calculates a memory backup possible amount, which is the amount of data that can be transferred from the main recording memory 102 to the external recording device 103, based on the amount of power that can be supplied from the storage battery 110 monitored by the power amount monitoring means 114, and when there is a data transfer instruction from the external recording device 103 to the main recording memory 102, calculates the sum of the amount of data measured by the main recorded amount monitoring means 112 and the amount of transfer data indicated by the data transfer instruction, and if this sum exceeds the amount of memory backup possible, displays an alarm in the display device 105, and interrupts the execution of the data transfer instruction from the

external recording device 103 to the main recording memory 102 until there is a predetermined input in the input device 1. The contents of the alarm displayed by the control means 115 to the display device 105 are a message indicating that it is an alarm, a data amount on the main memory 102 prior to data transfer by data transfer instructions, a data transfer amount indicated by the data transfer instructions, a calculated memory backup capacity, and a message prompting the input of a re-indication whether or not the data transfer instructions are actually executed.

【0012】 The operation of this example will now be described.

【0013】 Normally, i.e., when the supply voltage of the external power supply 106 is within a predetermined range, the power supply switching switch 108 is switched to the external power supply 106 side, and this computer system is operated with power from the external power supply 106, and the storage battery 110 is charged by the charger 111.

【0014】 In this state, it is assumed that a data transfer instruction was given to transfer data from external recording device 103 to main recording memory 102 by executing a program or inputting a command from input device 104. The control means 115, based on the value of the amount of power that may be supplied from the storage battery 110 monitored by the power quantity monitoring means 114, first calculates the maximum amount of data (memory backupable amount) that can be transferred from the main recording memory 102 to the external recording device 103 by only the power from the storage battery 110 when a memory backup must be performed. This calculation is based on the relationship data between the amount of power calculated during the design of the computer system and the amount of data that can be transferred. Then, the sum of the amount of data measured by the main recorded amount monitoring means 112 and the amount of transfer data instructed by the data transfer instructions is calculated, and the sum is determined to exceed the amount of memory backup possible, and if it cannot be exceeded, the data transfer based on the data transfer instructions is carried out by the transfer means 109. On the other hand, if the sum exceeds the memory backup possible amount, the control means 115 causes the display device 105 to display an alarm and interrupts the execution of data transfer instructions from the external recording device 103 to the main recording memory 102 until there is a predetermined input in the input device 105. As a result, it will not happen that data exceeding the memory backup capacity is stored on the main memory 102 without the operator knowing it. When an alarm is displayed in display device 105, the contents of this alarm are a message indicating that it is an alarm, the data amount on main memory 102 prior to data transfer by data transfer instructions, the data transfer amount indicated by data transfer instructions, the calculated amount of memory backup possible, and a message prompting the input of a re-indication whether or not data transfer instructions are actually performed, so the operator determines whether to cause the data transfer from external recording device 103 to main memory 102

to be carried out as is in consideration of the contents of this alarm. If the data transfer may be performed as is, the operator may enter a predetermined command indicating this into the input device 104, and if the data transfer is stopped, enter a command indicating abortion.

【0015】 On the other hand, if the supply voltage of the external power supply 106 deviates from the predetermined range, *the* power supply switching switch 108 is immediately switched to the storage battery 110 side by means of the power supply monitoring means 107, and this computer system is activated by power from the storage battery 110. At the same time, the CPU 101 initiates a shutdown process by warning from the power supply monitoring means 107, and the transfer means 109 initiates the transfer of the contents of the main recording memory 102 to the external recording device 103. In this case, unless the above-mentioned alarm by the control means 115 is ignored and the data transfer instructions are enforced, the amount of data on the main recording memory 102 is less than or equal to the amount of memory backup possible, so the data on the main recording memory 102 is completely evacuated to the external recording device 103.

【0016】

【Effects of the invention】 As explained above, the present invention has the effect of providing a control means for monitoring the amount of power that can be supplied from a backup power supply, a main memory monitoring means for measuring the amount of data in the main recording memory, the amount of memory backup possible, and a control means for calculating the current amount of data in the main recording memory and the amount of data transferred as instructed by the data transfer instructions from the external recording device, and for displaying an alarm in the display device if this sum exceeds the amount of memory backup possible, an alarm is issued in advance when data transfer from the external recording device prevents a backup from being performed completely.

【Short description of drawings】

【Figure 1】 A block diagram illustrating the configuration of a computer system with a memory backup guaranteed amount display function in one embodiment of the present invention.

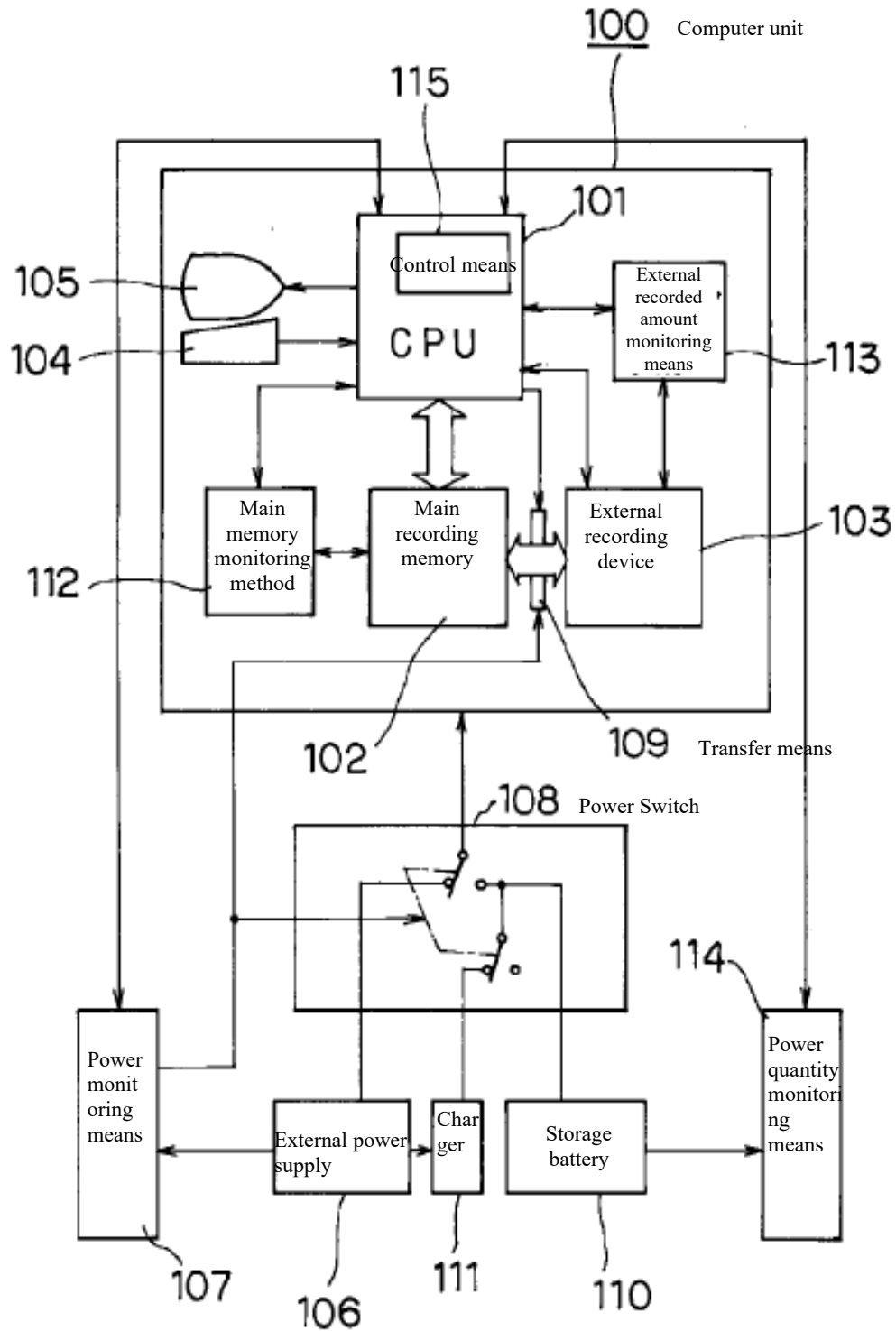
【Figure 2】 A block diagram showing the configuration of a conventional computer system with a memory backup function.

【Explanation of code】

|     |                           |
|-----|---------------------------|
| 100 | computer units            |
| 101 | CPU                       |
| 102 | main recording memory     |
| 103 | External recording device |
| 104 | input device              |
| 105 | Display device            |
| 106 | External power supply     |
| 107 | Power monitoring means    |
| 108 | Power Switch              |
| 109 | Transfer means            |
| 110 | storage battery           |
| 111 | charger                   |

- 112 Main recorded amount monitoring means  
113 External recorded amount monitoring means  
114 Power quantity monitoring means  
115 Control means

【Figure 1】



【Figure 2】

