A portable data processing system comprises a cartridge and a main apparatus, wherein the cartridge with a processing unit computes a plurality of control signals generated from the main apparatus and outputs a plurality of output signals to the main apparatus according to the control signals when the cartridge is combined with the main apparatus. Furthermore, the main apparatus, eliminating the computing function will be lighter, cheaper, and easier to be manufactured than the traditionally main apparatus with the processing unit.
100 portable hand-held game system

122 removable cartridge

game program memory 120

110 hand-held game machine

display 114

processing unit 112

FIG 1
200 portable data processing system

Cartridge 210

260 plurality of output signals

230 plurality of control signals

main apparatus 250

FIG. 2A
cartridge 210
processing unit 216
memory 214
plurality of control signals 230
plurality of output signals 260
212 first interface
218 bulge
220 plurality of pins
240/242

FIG. 2B
Switch means 220 plurality of pins 280 second interface 272 output interface 276 control interface 270 battery chamber 278 main apparatus 250

FIG. 2C
This patent application publication contains a control interface with the following elements:

- A control signal for "START" (23034)
- A control signal for "UP" (23035)
- A control signal for "RIGHT" (23036)
- A control signal for "DOWN" (23037)
- A control signal for "LEFT" (23038)
- A control signal for "RESET" (23039)

The interface includes:
- A start button (27034)
- An up button (27035)
- A right button (27036)
- A down button (27037)
- A left button (27038)
- A reset button (27039)

This diagram represents the control interface's layout and functionality.
FIG 2E
A PORTABLE DATA PROCESSING SYSTEM

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention generally relates to a data processing system, and more particularly to a portable data processing system.

[0003] 2. Description of the Prior Art

[0004] Traditionally, portable hand-held game systems have been known for quite some time. Typically, a portable hand-held game system 100 includes a hand-held game machine 110 housing a processing unit 112 for running a game program, and a display 114 for displaying images of the game, as shown in FIG. 1. The game program is typically contained in a game program memory 120, such as, for example, a semiconductor memory (e.g. ROM, EPROM, etc.) that is part of a removable cartridge 122. By storing the game program in the removable cartridge 122, the user is allowed to conveniently and easily change the game being played, by simply exchanging the cartridge with one containing a different game.

[0005] However, it is inconvenient for operating the hand-held game system that is always heavy, large, and expensive because of the processing unit, and the disadvantages or problems as described above are still found in various hand-held game systems in the foregoing.

SUMMARY OF THE INVENTION

[0006] Therefore, in accordance with the previous summary, objects, features and advantages of the present disclosure will become apparent to one skilled in the art from the subsequent description and the appended claims taken in conjunction with the accompanying drawings.

[0007] To overcome the above-noted and other deficiencies of prior portable hand-held game systems, and to improve the enjoyment of portable hand-held game system users, the instant invention provides a portable hand-held game system (called herein as a portable data processing system) that comprises a cartridge incorporating a processing unit for computing the data, which is inexpensive and easy for manufacturing the portable data processing system. In addition, numerous features are provided that enable the user to easily manipulate portable data processing system into the games being played.

[0008] The portable data processing system comprises a cartridge and a main apparatus, wherein the cartridge with a processing unit computes a plurality of control signals generated from the main apparatus and outputs a plurality of output signals to the main apparatus according to the control signals when the cartridge is combined with the main apparatus. Furthermore, the main apparatus eliminating the computing function will be lighter, cheaper, and easier to be manufactured than the traditionally main apparatus with the processing unit.

[0009] Both the foregoing and the following descriptions are exemplary and explanatory only and are not intended to limit the claimed invention in any manner whatsoever. The above described objects and other objects, features, aspects and advantages of the present invention will become more apparent from the following detailed description of the present invention when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] The accompanying drawings incorporated in and forming a part of the specification illustrate several aspects of the present invention, and together with the description serve to explain the principles of the disclosure. In the drawings:

[0011] FIG. 1 is a diagram illustrates a block diagram according to the prior art; and

[0012] FIG. 2a, FIG. 2b, FIG. 2c, FIG. 2d, and FIG. 2e are diagrams depict block diagrams according to the embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0013] The present disclosure can be described by the embodiments given below. It is understood, however, that the embodiments below are not necessarily limitations to the present disclosure, but are used to a typical implementation of the invention.

[0014] Having summarized various aspects of the present invention, reference will now be made in detail to the description of the invention as illustrated in the drawings. While the invention will be described in connection with these drawings, there is no intent to limit it to the embodiment or embodiments disclosed therein. On the contrary the intent is to cover all alternatives, modifications and equivalents included within the spirit and scope of the invention as defined by the appended claims.

[0015] It is noted that the drawings presents herein have been provided to illustrate certain features and aspects of embodiments of the invention. It will be appreciated from the description provided herein that a variety of alternative embodiments and implementations may be realized, consistent with the scope and spirit of the present invention.

[0016] It is also noted that the drawings presents herein are not consistent with the same scale. Some scales of some components are not proportional to the scales of other components in order to provide comprehensive descriptions and emphasizes to this present invention.

[0017] As shown in FIG. 2a, a portable data processing system 200 comprises a cartridge 210 and a main apparatus 250, wherein the cartridge 210 receives a plurality of control signals 230 generated from the main apparatus 250 and outputs a plurality of output signals 260 to the main apparatus 250 according to the control signals 230 when the cartridge 210 is combined with the main apparatus 250.

[0018] As shown in FIG. 2b, the cartridge 210 further comprises a first interface 212, a memory 214, a processing unit 216, and a bulge 218. The first interface 212 with a plurality of pins 220 transmits the control signals 230 and the output signals 260, the memory 214 stores a plurality of data 240 and a plurality of instruction codes 242, the processing unit 216 computes according to the data 240, the instruction codes 242, and the control signals 230 received from the first interface 212 so as to output the output signals 260 to the first interface 212 which is configured within the bulge 218.

[0019] As shown in FIG. 2c, the main apparatus 250 further comprises a control interface 270, a second interface 272, a slot 274, an output interface 276, a battery chamber 278, and a switch means 280, wherein the second interface 272 with
the pins 220 electronically couples with the first interface 212 so as to transmit the control signals 230 and the output signals 260. The battery chamber 278 assembles at least one battery so as to provide the electric power, and the switch means 280 controls the electric power to provide for the cartridge 210 and the main apparatus 250.

[0020] According to the present embodiment, the portable data processing system further comprises an extended means configured within said cartridge for generating the data and the instruction codes after receiving at least one signal, wherein the extended means may be an antenna, a camera lens, or a separable memory, and the data and the instruction codes may be plurality of MP3, a plurality of games, or GPS. As the foregoing description, the portable data processing system can receive a GPS signal by configuring the antenna, can be used for photographing as a digital camera by configuring the camera lens, or can add the volume of the memory by configuring the separable memory. In addition, the portable data processing system even can be played as a MP3 player or a game machine when the data and the instruction codes are the MP3 or the games.

[0021] As shown in FIG. 2d, the control interface 270 generates the control signals 230 to the second interface 272, wherein the control interface 270 further comprises a start button 27034, an up button 27035, a right button 27036, a down button 27037, a left button 27038, and a reset button 27039, wherein the start button 27034 inputs a control signal “START” 23034 whenever the start button 27034 is pressed, the up button 27035 inputs a control signal “UP” 23035 whenever the up button 27035 is pressed, the right button 27036 inputs a control signal “RIGHT” 23036 whenever the right button 27036 is pressed, the down button 27037 inputs a control signal “DOWN” 23037 whenever the down button 27037 is pressed, the left button 27038 inputs a control signal “LEFT” 23038 whenever the left button 27038 is pressed, and the reset button 27039 inputs a control signal “RESET” 23039 whenever the reset button 27039 is pressed.

[0022] As shown in FIG. 2e, the second interface 272 is configured within the slot 274, wherein the first interface 212 electrically couples with the second interface 272 when the bulge 218 inserts into the slot 274. The pins 220 further comprise sixty pins which are from pin “1” 22001 to pin “60” 22060, wherein the pin “34” 22034 electronically couples with the control signal “START” 23034 and an output signal “START” 26034 outputted from the processing unit 216 according to the control signal “START” 26034, the pin “35” 22035 electronically couples with the control signal “UP” 23035 and an output signal “UP” 26035 outputted from the processing unit 216 according to the control signal “UP” 23035, the pin “36” 22036 electronically couples with the control signal “RIGHT” 23036 and an output signal “RIGHT” 26036 outputted from the processing unit 216 according to the control signal “RIGHT” 23036, the pin “37” 22037 electronically couples with the control signal “DOWN” 23037 and an output signal “DOWN” 26037 outputted from the processing unit 216 according to the control signal “DOWN” 23037, the pin “38” 22038 electronically couples with the control signal “LEFT” 23038 and an output signal “LEFT” 26038 outputted from the processing unit 216 according to the control signal “LEFT” 23038, the pin “39” 22039 electronically couples with the control signal “RESET” 23039 and an output signal “RESET” 26039 outputted from the processing unit 216 according to the control signal “RESET” 23039, the two pins, pin “41” 22041 and pin “42” 22042, electronically couple with an output signal “VIDEO” 26041 outputted from the processing unit 216 according to the control signals 230, the pin “43” 22043 electronically couples with an output signal “AUDIO-L” 26043 outputted from the processing unit 216 according to the control signals 230, and the pin “44” 22044 electronically couples with an output signal “AUDIO-R” 26044 outputted from the processing unit 216 according to the control signals 230, and the output signals 260 further comprise an eight-bit data 26005 which electronically couples with the eight pins from pin “5” 22005 to pin “12” 22012.

[0023] The pin “1” 22001 electronically couples with a signal “SHDB”, the pin “2” 22002 electronically couples with a signal “SCEN”, the pin “3” 22003 electronically couples with a signal “SCL”, the pin “4” 22004 electronically couples with a signal “SDA”, the pin “14” 22014 electronically couples with a signal “HD”, the pin “15” 22015 electronically couples with a signal “VD”, the pin “31” 22031 electronically couples with a signal “A”, the pin “32” 22032 electronically couples with a signal “B”, the pin “33” 22033 electronically couples with a signal “C”, and the pin “45” 22045 electronically couples with a signal “LCDOFF”. The pin “16”, “pin 17”, and pin “30” 22030 electronically couple with at least ground circuit. The pin “46” and pin “47” electronically couple with a 4.5 V power source, and the pin “59” and pin “60” electronically couple with a 3.3 V power source. Other pins are unused and prepare for other purposes in the future.

[0024] The output interface 276 outputs the output signal 260 received from the second interface 272, wherein the output interface 276 further comprises a display 282 and an audio device 284. The display 282 plays the output signal “VIDEO” 26041, and the audio device 284 plays the output signal “AUDIO-L” 26043 and the output signal “AUDIO-R” 26044.

[0025] The foregoing description is not intended to be exhaustive or to limit the invention to the precise forms disclosed. Obvious modifications or variations are possible in the light of the above teachings. In this regard, the embodiment or embodiments discussed were chosen and described to provide the best illustration of the principles of the invention and its practical application to thereby enable one of ordinary skill in the art to utilize the invention in various embodiments and with various modifications as are suited to the particular use contemplated. All such modifications and variations are within the scope of the inventions as determined by the appended claims when interpreted in accordance with the breadth to which they are fairly and legally entitled.

[0026] It is understood that several modifications, changes, and substitutions are intended in the foregoing disclosure and in some instances some features of the invention will be employed without a corresponding use of other features. Accordingly, it is appropriate that the appended claims be construed broadly and in a manner consistent with the scope of the invention.

1. A portable data processing system, comprising: a cartridge, comprising:
   a first interface with a plurality of pins for transmitting a plurality of control signals and a plurality of output signals;
   a memory for storing a plurality of data and a plurality of instruction codes;
   a processing unit for computing according to said data, said instruction codes, and said control signals received from said first interface so as to output said output signals to said first interface;
a bulge, wherein said first interface is configured within said bulge;
a main apparatus, comprising:
a second interface with said pins for electronically coupling with said first interface so as to transmit said control signals and said output signals;
a control interface for generating said control signal to said second interface;
an output interface for outputting said output signals received from said second interface; and
a slot, wherein said second interface is configured within said slot, wherein said first interface electrically couples with said second interface when said bulge inserts into said slot.

2. A portable data processing system of claim 1, further comprises an extended means for being configured within said cartridge.

3. A portable data processing system of claim 2, wherein said extended means generates said data and said instruction codes after receiving at least one signal.

4. A portable data processing system of claim 3, wherein said extended means at least includes one of the following and any combinations thereof: an antenna, and a camera lens.

5. A portable data processing system of claim 2, wherein said extended means is a separable memory for adding the volume of said memory.

6. A portable data processing system of claim 1, wherein said data and said instruction codes at least include one of the following and any combinations thereof: a plurality of MP3, a plurality of games and GPS.

7. A portable data processing system of claim 1, wherein said main apparatus further comprises a battery chamber for assembling at least one battery so as to provide the electric power.

8. A portable data processing system of claim 1, wherein said main apparatus further comprises a switch means for control said electric power to provide for said cartridge and said main apparatus.

9. A portable data processing system of claim 1, wherein said control interface further comprises a plurality of buttons.

10. A portable data processing system of claim 9, wherein said buttons comprise:
a start button for inputting a control signal “START” whenever said start button is pressed;
an up button for inputting a control signal “UP” whenever said up button is pressed;
a right button for inputting a control signal “RIGHT” whenever said right button is pressed;
a down button for inputting a control signal “DOWN” whenever said down button is pressed;
a left button for inputting a control signal “LEFT” whenever said left button is pressed; and
a reset button for inputting a control signal “RESET” whenever said reset button is pressed.

11. A portable data processing system of claim 10, wherein said pins further comprise sixty pins which are from pin 1 to pin 60.

12. A portable data processing system of claim 11, wherein said pins further comprise:
said pin 34 electronically couples with said control signal “START” and an output signal “START” outputted from said processing unit according to said control signal “START”;
said pin 35 electronically couples with said control signal “UP” and an output signal “UP” outputted from said processing unit according to said control signal “UP”;
said pin 36 electronically couples with said control signal “RIGHT” and an output signal “RIGHT” outputted from said processing unit according to said control signal “RIGHT”;
said pin 37 electronically couples with said control signal “DOWN” and an output signal “DOWN” outputted from said processing unit according to said control signal “DOWN”;
said pin 38 electronically couples with said control signal “LEFT” and an output signal “LEFT” outputted from said processing unit according to said control signal “LEFT”;
said pin 39 electronically couples with said control signal “RESET” and an output signal “RESET” outputted from said processing unit according to said control signal “RESET”; said two pins, pin “41” and pin “42”, electronically couple with an output signal “VIDEO” outputted from said processing unit according to said control signals;
said pin 43 electronically couples with an output signal “AUDIO-L” outputted from said processing unit according to said control signals, and said pin “44” electronically couples with an output signal “AUDIO-R” outputted from said processing unit according to said control signals;
said output signals further comprise an eight-bit data which electrically couples with said eight pins from pin “5” to pin “12”.

13. A portable data processing system, comprising:
a cartridge, comprising:
a first interface with a plurality of pins for transmitting a plurality of control signals and a plurality of output signals;
a memory for storing a plurality of data and a plurality of instruction codes;
a processing unit for computing said data, said instruction codes, and said control signals received from said first interface so as to output said output signals to said first interface;
a bulge, wherein said first interface is configured within said bulge;
a main apparatus, comprising:
a second interface with said pins for electronically coupling with said first interface so as to transmit said control signals and said output signals;
a control interface for generating said control signals to said second interface, wherein said control interface further comprises a plurality of buttons;
a output interface for outputting said output signals received from said second interface; and
a slot, wherein said second interface is configured within said slot, wherein said first interface electrically couples with said second interface when said bulge inserts into said slot;
a battery chamber for assembling at least one battery so as to provide the electric power;
a switch means for control said electric power to provide for said cartridge and said main apparatus; and
an extended means for being configured within said cartridge.
14. A portable data processing system of claim 13, wherein
said extended means generates said data and said instruction
codes after receiving at least one signal.
15. A portable data processing system of claim 14, wherein
said extended means at least includes one of the following and
any combinations thereof: an antenna and a camera lens.
16. A portable data processing system of claim 13, wherein
said extended means is a separable memory for adding the
volume of said memory.
17. A portable data processing system of claim 13, wherein
said data and said instruction codes at least include one of the
following and any combinations thereof: a plurality of MP3,
a plurality of games and GPS.
18. A portable data processing system of claim 13, wherein
said buttons comprise:
- a start button for inputting a control signal “START” whenever said start button is pressed;
- an up button for inputting a control signal “UP” whenever said up button is pressed;
- a right button for inputting a control signal “RIGHT” whenever said right button is pressed;
- a down button for inputting a control signal “DOWN” whenever said down button is pressed;
- a left button for inputting a control signal “LEFT” whenever said left button is pressed; and
- a reset button for inputting a control signal “RESET” whenever said reset button is pressed.
19. A portable data processing system of claim 18, wherein
said pins further comprise sixty pins which are from pin 1 to
pin 60.
20. A portable data processing system of claim 19, wherein
said pins further comprise:
- said pin “35” electronically couples with said control signal “UP” and an output signal “UP” outputted from said
  processing unit according to said control signal “UP”;
- said pin “36” electronically couples with said control signal “RIGHT” and an output signal “RIGHT” outputted
  from said processing unit according to said control signal “RIGHT”;
- said pin “37” electronically couples with said control signal “DOWN” and an output signal “DOWN” outputted
  from said processing unit according to said control signal “DOWN”;
- said pin “38” electronically couples with said control signal “LEFT” and an output signal “LEFT” outputted
  from said processing unit according to said control signal “LEFT”;
- said pin “39” electronically couples with said control signal “RESET” and an output signal “RESET” outputted
  from said processing unit according to said control signal “RESET”;
- said two pins, pin “41” and pin “42”, electronically couple
  with an output signal “VIDEO” outputted from said
  processing unit according to said control signals;
- said pin “43” electronically couples with an output signal “AUDIO-L” outputted from said processing unit accord-
  ing to said control signals, and said pin “44” electronically
  couples with an output signal “AUDIO-R” outputted from
  said processing unit according to said control signals;
- said output signals further comprise an eight-bit data which
  electronically couples with said eight pins from pin “5”
  to pin “12”.

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