Title: CONNECTABLE APPARATUS AND ASSOCIATED METHODS

Abstract: An apparatus comprising: a connector, the connector being configured to enable a physical connection and a data connection with a peripheral device; a switch, the switch being associated with the connector and being configured to enable generation of a connection signalling based on the physical connection between the peripheral device and the connector; and a processor, the processor configured to: determine, in response to the connection signalling, whether or not the physical connection between the apparatus and peripheral device has been established; and enable the data connection between the apparatus and the peripheral device based on the determination.

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Declarations under Rule 4.17:
— of inventorship (Rule 4.17(iv))
CONNECTABLE APPARATUS AND ASSOCIATED METHODS

Technical Field
The present disclosure relates to the field of connecting one or more peripheral device (e.g. headset, SIM card) to an apparatus (computer or other electronic device), associated methods, and computer programs. Certain disclosed aspects/embodiments relate to portable electronic devices, in particular, so-called hand-portable electronic devices which may be hand-held in use (although they may be placed in a cradle in use). Such hand-portable electronic devices include so-called Personal Digital Assistants (PDAs).

The portable electronic devices/apparatus according to one or more disclosed aspects/embodiments may provide one or more audio/text/video communication functions (e.g. tele-communication, video-communication, and/or text transmission (Short Message Service (SMS)/ Multimedia Message Service (MMS)/emailing) functions), interactive/non-interactive viewing functions (e.g. web-browsing, navigation, TV/program viewing functions), music recording/playing functions (e.g. MP3 or other format and/or (FM/AM) radio broadcast recording/playing), downloading/sending of data functions, image capture function (e.g. using a (e.g. in-built) digital camera), and gaming functions.

Background
An electronic apparatus (e.g. computers, mobile telephones) may be configured to connect to one or more peripheral devices (e.g. headsets, speakers, SIM cards, memory cards, removable memory devices, USB sticks, flash drives) to provide additional functionality. In order to enable the user to make use of the additional functionality of the peripheral device, the electronic apparatus may, for example, have to recognise and form a data connection between the electronic apparatus and peripheral device.

The listing or discussion of a prior-published document or any background in this specification should not necessarily be taken as an acknowledgement that the document or background is part of the state of the art or is common general knowledge. One or more aspects/embodiments of the present disclosure may or may not address one or more of the background issues.
Summary

In a first aspect, there is provided an apparatus comprising:

- a connector, the connector being configured to enable a physical connection and a data connection with a peripheral device;
- a switch, the switch being associated with the connector and being configured to enable generation of a connection signalling based on the physical connection between the peripheral device and the connector; and
- a processor, the processor configured to:
  - determine, in response to the connection signalling, whether or not the physical connection between the apparatus and peripheral device has been established; and
  - enable the data connection between the apparatus and the peripheral device based on the determination.

The switch may be configured to be activated when the peripheral device has a physical connection to the apparatus. The switch may be configured to be activated when the peripheral device is in the process of being physically connected to the apparatus.

The switch may comprise a key of a matrix keyboard. The switch may be configured to be contained within the connector.

The apparatus may be configured to: maintain a list of physical connections and/or data connections, the list being updated on the basis of the signalling.

The apparatus may comprise memory comprising computer program code.

In a second aspect, there is provided a method comprising:

- enabling, via a connector, a physical connection and a data connection with a peripheral device;
- enabling, by a switch, generation of a connection signalling based on the physical connection between the peripheral device and the connector; and
- determining, in response to the connection signalling, whether or not the physical connection between the apparatus and peripheral device has been established; and
- enabling the data connection between the apparatus and the peripheral device based on the determination.
In a third aspect, there is provided a computer program, the computer program comprising computer program code configured to:

- enable, via a connector, a data connection between an apparatus and a peripheral device, wherein the connector is configured to enable a physical connection between the apparatus and peripheral device;
- enable generation of a connection signalling based on the physical connection between the peripheral device and the connector; and
- enable determination, in response to the connection signalling, whether or not the physical connection between the apparatus and peripheral device has been established;

and

- enable the data connection between the apparatus and the peripheral device based on the determination.

The computer program may be stored on a CD, a DVD, a USB stick, a flash drive, a memory card and/or a non-transitory medium.

In a fourth aspect there is provided a peripheral device comprising:

- a connector, the connector being configured to enable a physical connection and a data connection with an apparatus,
- the peripheral device being configured to activate a switch of the apparatus when the peripheral device is physically connected to the apparatus,

wherein the switch is configured to enable generation of a connection signalling based on the physical connection between the peripheral device and the connector.

In a fifth aspect there is provided a method comprising:

- providing a connector, the connector being configured to enable a physical connection and a data connection between a peripheral device and an apparatus,
- activating a switch of the apparatus when the peripheral device is physically connected to the apparatus,

wherein the switch is configured to enable generation of a connection signalling based on the physical connection between the peripheral device and the connector.

The present disclosure includes one or more corresponding aspects, embodiments or features in isolation or in various combinations whether or not specifically stated (including claimed) in that combination or in isolation. Corresponding means for performing one or more of the discussed functions are also within the present disclosure.
Corresponding computer programs for implementing one or more of the methods disclosed are also within the present disclosure and encompassed by one or more of the described embodiments.

The above summary is intended to be merely exemplary and non-limiting.

**Brief Description of the Figures**

A description is now given, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 illustrates an example embodiment of the apparatus comprising a number of electronic components, including memory, a processor and a communication unit.

Figure 2 depicts an example embodiment with a touch screen and physical buttons.

Figure 3a depicts the peripheral device before it has a physical connection to the connector.

Figure 3b shows the configuration of the matrix keyboard.

Figure 3c illustrates the peripheral device as it is being physically connected to the connector.

Figure 3d depicts the peripheral device after it has a physical connection to the connector.

Figure 4a shows a connector of a further embodiment and a further peripheral device.

Figure 4b illustrates the further peripheral device when it has a physical connection to the connector.

Figure 5 shows a flow diagram illustrating how the data connection, between an apparatus and a peripheral device, is established.

Figure 6 illustrates schematically a computer readable media providing a program according to an embodiment of the present invention.

**Description of Example Aspects/Embodiments**

Other embodiments depicted in the figures have been provided with reference numerals that correspond to similar features of earlier described embodiments. For example, feature number 1 can also correspond to numbers 101, 201, 301 etc. These numbered features may appear in the figures but may not have been directly referred to within the description of these particular embodiments. These have still been provided in the
figures to aid understanding of the further embodiments, particularly in relation to the features of similar earlier described embodiments.

It is now common for the functionality of an apparatus to be augmented by connecting peripheral device. For example, a computer without a printing capability can be provided with such a capability by connecting an external printer, for example, via a parallel port. In order for the apparatus to utilise the additional functionality of the peripheral device, the apparatus may have to recognise that it is connected to the peripheral device in order to allow data to be transferred between the apparatus and the peripheral device.

Figure 1 depicts an example embodiment 101 of an apparatus, such as a mobile phone or personal digital assistant. In other example embodiments, the apparatus 101 may comprise a module for a mobile phone (or PDA, audio/video player or other suitable device), and may just comprise a suitably configured memory 107 and processor 108 (see below).

The apparatus 101 of Figure 1 is configured such that it may receive, include, and/or otherwise access data. For example, this example embodiment 101 comprises a communications unit 103, such as a receiver, transmitter, and/or transceiver, in communication with an antenna 102 for connecting to a wireless network and/or a connector 104 for accepting a physical connection to, for example, a network, such that data may be received via one or more types of networks. This example embodiment comprises a memory 107 that stores data, possibly after being received via an antenna 102 or connector 104 or after being generated at the user interface 106. The processor 108 may receive data from the user interface 106, from the memory 107, or from the communication unit 103. Regardless of the origin of the data, these data may be outputted to a user of apparatus 101 via the display 105, and/or any other output devices provided with or connected to the apparatus. The processor 108 may also store the data for later use in the memory 107. The memory 107 may store computer program code and/or applications which may be used to instruct/enable the processor 108 to perform functions (e.g. generate, delete, read, write and/or process data). It will be appreciated that other example embodiments may comprise additional displays (e.g. CRT screen, LCD screen and/or plasma screen) and/or user interfaces (e.g. physical keys and/or buttons). It will be appreciated that references to a memory or a processor may encompass a plurality of memories or processors.
Figure 2 depicts the outward appearance of the example embodiment of figure 1 comprising a portable electronic device 101, e.g. such as a mobile phone, with a user interface comprising a touch-screen 105, a physical keypad 106 comprising buttons, a memory (not shown) and a processor (not shown). The portable electronic device is configured to allow the user to interact with the portable electronic device with his/her finger on the touch screen 105. The apparatus 101 allows one or more peripheral devices to have a physical and a data connection using the connector 104. It will be appreciated that different embodiments may enable physical and data connection via more than one connector.

Figure 3a depicts the internal mechanism of the connector 104 of the embodiment of figure 1, and a peripheral device 151, which in this case is a memory card. In this case, the user has data, stored in the memory 153 of the memory card peripheral device 151, which he wishes to transfer to the apparatus 104.

The connector 104 of the apparatus, in this case comprises a shaped cavity configured to complement the shape of the peripheral device 151. The connector 104 comprises a data contact 111 configured to enable a data connection between the peripheral device 151 and the processor 108 of the apparatus. The connector 104 further comprises a switch 112 which is configured to detect when the peripheral device 151 is being inserted into the connector (in order to form a physical connection). The switch 112 in this case is contained within the shaped cavity of the connector 104. The switch, in this case, is connected to the processor 108 of the apparatus by electrical wires 113.

It will be appreciated that the physical connection may be considered to encompass connections where the peripheral device is in direct physical contact with the connector of the apparatus. The data connection may be considered to encompass a connection whereby data can be transmitted between the apparatus and the peripheral device via the connector. The physical connection may be configured to enable a data connection (e.g. where corresponding electrical contacts of the apparatus and peripheral device are in contact).

The peripheral device 151, which in this case is a memory card, comprises a shaped body to enable a physical connection between the peripheral device 151 and the apparatus 101 to be maintained. The body of the peripheral device 151 also comprises a protrusion 152 configured to depress and release the switch 112 when a physical connection between the connector and the peripheral device is being established.
It will be appreciated that a peripheral device may include equipment which can interact with the apparatus and provide additional functionality to the electronic device. Examples of peripheral devices may also include printers, scanners, tape drives, disc drives, microphones, speakers, computers, laptops, webcams, keyboards, mice, monitors, SIM cards, memory cards, removable memory devices, headsets and cameras. The peripheral device may enable connection to a network (e.g. a internet connector). Examples of functionality may include providing additional user interfaces, data storage, data transfer, printing and communication. The peripheral device may be one or more of an electronic device, a portable electronic device and a module for an electronic device,

The switch 112, contained within the shaped cavity of the connector 104, in this case is a key of a 4×4 matrix keyboard 133. The input/output lines 131, 132 and switches 112 of the matrix keyboard are depicted in figure 3b. The matrix keyboard, in this case, uses limited input/output lines 131, 132 to provide for multiple corresponding keys. In this case, eight (4×4) input/output lines 131, 132 are configured to implement sixteen (4×4) keys/switches 112, as depicted in figure 3b. The input/output lines 131, 132 are connected to the processor 108 such that the voltage values of the lines 131, 132 can be set and/or read by the processor.

It will be appreciated that the switch may comprise one of a key, a button, a light sensitive diode, a photodiode, an actuator, a transistor, a piezo-switch, a pressure switch and a micro switch. The switch may be configured to generate connection signalling in response to being activated (e.g. being pressed). The switch may be configured to enable generation of a disconnection signalling based on the physical disconnection of the peripheral device from the apparatus. The disconnection signalling may be the same as, or different from, the connection signalling.

The matrix keyboard 133 keys 112, in this case, comprise switches connected in a matrix of rows and columns. In this case, each switch of a given row of the matrix is connected to the same one of the four output port row lines 132. In this case, each switch of a given column of the matrix is connected to one of the four input port column lines 131.

In this case, when no key is pressed, the column lines are configured to be at a predetermined default voltage value (e.g. high or 3V).
In this case, when a key/s switch 112 is of the matrix keyboard 133 is pressed, the key 112 is configured to connect the associated row line 132 to the corresponding column line 131. If, for example, a row is at a voltage level distinct from the default voltage line (e.g. if the default voltage is high and the row line is low) and a key in that row is pressed, this distinct voltage level will be detectable on the column line that contains the pressed key. This detectable change in voltage may act as connection and/or disconnection signalling.

By scanning the values of the column lines and of the row lines, the processor may determine which key of the matrix keyboard has been pressed. Keys of the matrix keyboard could be used, for example, as keys for the user interface and/or as switches associated with connectors.

Figure 3c depicts the peripheral device and apparatus when a physical connection between the connector and the peripheral device is being established. During establishment of the physical connection, the protrusion depresses the (matrix key) switch 112. This depression may be of duration of around a few milliseconds (e.g. between 1 and 100 milliseconds), depending on the speed of movement and the widths of the protrusion and the switch. During the depression the corresponding row and column is connected by the switch 112. This temporary depression will enable generation of connection signalling. In this case the connection signalling is in the form of an interrupt. The interrupt will trigger the processor to scan the matrix keyboard to determine which key is or has been pressed (e.g. as described above). The information denoting the pressed key, in this example, is temporarily retained by the processor.

It will be appreciated that for other embodiments the connection and/or disconnection signalling may be wireless signalling. Examples of wireless signalling may include ultrasound, infrared, visible light and radio waves. The signalling may be wired signalling.

Figure 3d depicts the apparatus and the peripheral device when the peripheral device has been fully inserted into the corresponding connector and a physical connection established. The contacts 154 of the peripheral device are in contact with the contacts 111 of the connector. The protrusion is, in this case, now beyond the switch and the switch has reverted back to its original position. This will remove the contact between the row and column lines of the matrix keyboard.

In this case, when the contact is removed, and if a key associated with the connector has been pressed, the processor will initiate a scan of the connector, corresponding to the
pressed key, in order to determine whether the peripheral device 151 has a physical connection to the apparatus (e.g. whether or not the peripheral device has a physical connection or not, and/or whether the peripheral device can support a data connection with the apparatus). This scan may be carried out, for example, by measuring the voltage, capacitance, current or some other parameter of the connector and comparing the measured value to a predetermined value. In the case depicted in figure 3d, the scan would indicate that the peripheral device had a physical connection to the apparatus such that a data connection could be supported. The processor 108 would then enable data connection using the apparatus 101 contacts 111 and the peripheral device contacts. It will be appreciated that the apparatus may prompt the user for confirmation before establishing a data connection between the apparatus and the peripheral device. The apparatus could then use this data connection to transmit and/or receive information from the peripheral device. For example, in this case, the apparatus could transmit data for storage on the memory card peripheral device.

In this case the apparatus is configured to maintain a list of peripheral devices with a data connection to the apparatus. This is updated when the data connection is initiated.

It will be appreciated that for other embodiments the switch may be configured to be depressed when the peripheral device has a physical connection to the apparatus. It will be appreciated that for other embodiments, the apparatus will be configured to scan the connector when any switch of the matrix keyboard has been pressed.

When equipment is removed from the slot, it will trigger the same switch 112. This activation of the switch 112 will generate disconnection signalling which will be sent to the processor 108. In this case, the form of the disconnection signalling is the same as the connection signalling, it will be appreciated that, for other embodiments, the disconnection signalling may be distinguishable from the connection signalling. The processor, in this case, is configured to scan the corresponding connector. Where the scan indicates that the peripheral device 151 has been removed such that it no longer has a physical connection with the apparatus, the processor 108 will update the list of peripheral devices to indicate that the connector 104 is free and terminate any data connections with the peripheral device.

It will be appreciated that for other embodiments the signalling may comprise a combination of one or more of a voltage level change, a software interrupt, a hardware interrupt and instructions. An interrupt may be an asynchronous signal. An interrupt may
cause the processor to save its state of execution and begin execution of an interrupt handler.

It will be appreciated that for other embodiments the apparatus may comprise a plurality of connectors and associated switches, each switch having a respective signal. The processor may be configured to determine which switch has been activated on the basis of the associated signal.

It will be appreciated that for other embodiments the connector may comprise one or more of, for example, a USB port, a serial port, a parallel port, a firewire port and an Ethernet port.

It will be appreciated that the apparatus may comprise an electronic device, a portable electronic device, a module for an electronic device, a mobile phone, a computer, a laptop, a printer, a phone, a personal digital assistant (PDA), and/or a games console.

Figure 4a depicts the connector 404 of a second embodiment 401 such as, for example, a computer. Figure 4a also depicts a peripheral device which in this case is a disc drive. In this case, the user wishes to use the disc drive to read the data on a disc and utilise the data on the computer.

Unlike the first embodiment which enables a physical connection to be maintained by using the complementary shape of the connector and the peripheral device, this embodiment 401 is configured to maintain physical connection using magnetic attraction. That is, in this case, the connector of the apparatus contains a magnet (not shown) and the corresponding connector of the peripheral device (which in this case is a disc drive) contains a ferromagnetic material (e.g. iron). It will be appreciated that in some embodiments, the magnet could be in the connector of the apparatus, the connector of the peripheral device or both. In this case the switch is configured to be in the same plane as the connector.

In this case, like the previous embodiment, the data connection is facilitated by having apparatus contacts 411 and peripheral device contacts 454 which can be brought into contact with each other.

The switch 412, associated with the connector, in this case is configured to be activated when the connector 455 of the peripheral device 451 has a physical connection to the
connector of the apparatus such that a data connection can be established. When the
switch is activated (e.g. depressed), the switch is configured to transmit connection
signalling to the processor 408. In this case the connection signalling comprises a
constant high level voltage (e.g. 1.5V) corresponding to the switch being activated. In
response to the connection signalling, the processor is configured to scan the connector
to determine whether the peripheral device 451 has a physical connection such as to
enable a data connection. The processor 408 is configured to enable data connection
when it has detected that the peripheral device 451 has a physical connection. In this
case, for example, when the data connection has been established, data can be read by
the disc drive peripheral device 451 and transmitted via the data connection to the
apparatus.

It will be appreciated that other embodiments may establish a data connection based on
the connection signalling without scanning the connector to determine whether a suitable
physical connection has been established.

For this embodiment disconnecting the peripheral device connector from the apparatus
connector results in the switch reverting to its normal position and the connection
signalling ceasing (as the constant high voltage source has been removed), in this case
the apparatus is configured to detect that the switch has been deactivated and cancel the
data connection to the peripheral device.

Advantages of the apparatus may include that the apparatus may to detect peripheral
device (accessories or other device) connection and/or disconnection automatically.
Furthermore, polling of the ports may be reduced. This may lower energy and/or power
usage. This may allow the standby time and play time (e.g. call time for phone) to be
extended. Using a connector and a switch in this way may save cost and PCB size (e.g.
compared to using external interrupt extension chip). This can save CPU power and
battery (e.g. compared to use polling mode).

Figure 5 shows a flow diagram illustrating how the data connection, between an
apparatus and a peripheral device, is established.

Figure 6 illustrates schematically a computer/processor readable media 500 providing a
program according to an embodiment of the present invention. In this example, the
computer/processor readable media is a disc such as a digital versatile disc (DVD) or a
compact disc (CD). In other embodiments, the computer readable media may be any media that has been programmed in such a way as to carry out an inventive function.

It will be appreciated to the skilled reader that any mentioned apparatus/device and/or other features of particular mentioned apparatus/device may be provided by apparatus arranged such that they become configured to carry out the desired operations only when enabled, e.g. switched on, or the like. In such cases, they may not necessarily have the appropriate software loaded into the active memory in the non-enabled (e.g. switched off state) and only load the appropriate software in the enabled (e.g. on state).

The apparatus may comprise hardware circuitry and/or firmware. The apparatus may comprise software loaded onto memory. Such software/computer programs may be recorded on the same memory/processor/functional units and/or on one or more memories/processors/functional units.

In some embodiments, a particular mentioned apparatus/device may be pre-programmed with the appropriate software to carry out desired operations, and wherein the appropriate software can be enabled for use by a user downloading a "key", for example, to unlock/enable the software and its associated functionality. Advantages associated with such embodiments can include a reduced requirement to download data when further functionality is required for a device, and this can be useful in examples where a device is perceived to have sufficient capacity to store such pre-programmed software for functionality that may not be enabled by a user.

It will be appreciated that the any mentioned apparatus/circuitry/elements/processor may have other functions in addition to the mentioned functions, and that these functions may be performed by the same apparatus/circuitry/elements/processor. One or more disclosed aspects may encompass the electronic distribution of associated computer programs and computer programs (which may be source/transport encoded) recorded on an appropriate carrier (e.g. memory, signal).

It will be appreciated that any "computer" described herein can comprise a collection of one or more individual processors/processing elements that may or may not be located on the same circuit board, or the same region/position of a circuit board or even the same device. In some embodiments one or more of any mentioned processors may be distributed over a plurality of devices. The same or different processor/processing elements may perform one or more functions described herein.
It will be appreciated that the term "signalling" may refer to one or more signals transmitted as a series of transmitted and/or received signals. The series of signals may comprise one, two, three, four or even more individual signal components or distinct signals to make up said signalling. Some or all of these individual signals may be transmitted/received simultaneously, in sequence, and/or such that they temporally overlap one another.

With reference to any discussion of any mentioned computer and/or processor and memory (e.g. including ROM, CD-ROM etc), these may comprise a computer processor, Application Specific Integrated Circuit (ASIC), field-programmable gate array (FPGA), and/or other hardware components that have been programmed in such a way to carry out the inventive function.

The applicant hereby discloses in isolation each individual feature described herein and any combination of two or more such features, to the extent that such features or combinations are capable of being carried out based on the present specification as a whole, in the light of the common general knowledge of a person skilled in the art, irrespective of whether such features or combinations of features solve any problems disclosed herein, and without limitation to the scope of the claims. The applicant indicates that the disclosed aspects/embodiments may consist of any such individual feature or combination of features. In view of the foregoing description it will be evident to a person skilled in the art that various modifications may be made within the scope of the disclosure.

While there have been shown and described and pointed out fundamental novel features of the invention as applied to preferred embodiments thereof, it will be understood that various omissions and substitutions and changes in the form and details of the devices and methods described may be made by those skilled in the art without departing from the spirit of the invention. For example, it is expressly intended that all combinations of those elements and/or method steps which perform substantially the same function in substantially the same way to achieve the same results are within the scope of the invention. Moreover, it should be recognized that structures and/or elements and/or method steps shown and/or described in connection with any disclosed form or embodiment of the invention may be incorporated in any other disclosed or described or suggested form or embodiment as a general matter of design choice. Furthermore, in the claims means-plus-function clauses are intended to cover the structures described herein as performing the recited function and not only structural equivalents, but also
equivalent structures. Thus although a nail and a screw may not be structural equivalents in that a nail employs a cylindrical surface to secure wooden parts together, whereas a screw employs a helical surface, in the environment of fastening wooden parts, a nail and a screw may be equivalent structures.
WHAT IS CLAIMED IS:

1. An apparatus comprising:
   a connector, the connector being configured to enable a physical connection and a data connection with a peripheral device;
   a switch, the switch being associated with the connector and being configured to enable generation of a connection signalling based on the physical connection between the peripheral device and the connector; and
   a processor, the processor configured to:
      determine, in response to the connection signalling, whether or not the physical connection between the apparatus and peripheral device has been established;
      and
      enable the data connection between the apparatus and the peripheral device based on the determination.

2. The apparatus of claim 1, wherein the switch is configured to be activated when the peripheral device has a physical connection to the apparatus.

3. The apparatus of claim 1, wherein the switch comprises a key of a matrix keyboard.

4. The apparatus of claim 1, wherein the switch is configured to be contained within the connector.

5. The apparatus of claim 1, wherein the switch is configured to enable generation of a disconnection signalling based on the physical disconnection of the peripheral device from the apparatus.

6. The apparatus of claim 1, wherein the apparatus is configured to:
   maintain a list of physical connections and/or data connections, the list being updated on the basis of the signalling.

7. The apparatus of claim 1, wherein the apparatus comprises memory comprising computer program code.
8. The apparatus of claim 1, wherein the switch comprises one of a key, a button, a light sensitive diode, an actuator, a transistor, a piezo-switch, a pressure switch and a micro switch.

9. The apparatus of claim 1, wherein the signalling comprises instructions, a software interrupt and/or hardware interrupt.

10. The apparatus of claim 1, wherein the apparatus comprises a plurality of connectors and associated switches, each switch having a respective signal.

11. The apparatus of claim 1, wherein the connector comprises one or more of a USB port, a serial port, a parallel port, a firewire port, a PS/2 connector, a Video Graphics array connector and an Ethernet port.

12. The apparatus of claim 1, wherein the apparatus comprises an electronic device, a portable electronic device, a module for an electronic device, a mobile phone, a computer, a laptop, a printer.

13. Method, the method comprising:
   enabling, via a connector, a physical connection and a data connection with a peripheral device;
   enabling by a switch generation of a connection signalling based on the physical connection between the peripheral device and the connector; and
   determining, in response to the connection signalling, whether or not the physical connection between the apparatus and peripheral device has been established; and
   enabling the data connection between the apparatus and the peripheral device based on the determination.

14. A computer program, the computer program comprising computer program code configured to:
   enable, via a connector, a data connection between an apparatus and a peripheral device, wherein the connector is configured to enable a physical connection between the apparatus and peripheral device;
   enable generation of a connection signalling based on the physical connection between the peripheral device and the connector; and
enable determination, in response to the connection signalling, whether or not the physical connection between the apparatus and peripheral device has been established; and enable the data connection between the apparatus and the peripheral device based on the determination.

15. A peripheral device comprising:
a connector, the connector being configured to enable a physical connection and a data connection with an apparatus,
the peripheral device being configured to activate a switch of the apparatus when the peripheral device is physically connected to the apparatus, wherein the switch is configured to enable generation of a connection signalling based on the physical connection between the peripheral device and the connector.

16. A method, the method comprising;
providing a connector, the connector being configured to enable a physical connection and a data connection between a peripheral device and an apparatus, activating a switch of the apparatus when the peripheral device is physically connected to the apparatus,
wherein the switch is configured to enable generation of a connection signalling based on the physical connection between the peripheral device and the connector.
Figure 5

1. Enable a physical connection with a peripheral device
2. Enable generation of a connection signalling
3. Determine whether or not the physical connection between the apparatus and peripheral device has been established
4. Enable the data connection between the apparatus and the peripheral device

Figure 6
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

According to International Patent Classification (IPC) or to both national classification and IPC

G06F 3/00 (2006.01) i

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: G06F, H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNBAS,CNKI,DWPI,EPDOC: peripheral device, connect, physical, signaling, USB, port, switch, activate, structure, recognize

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Abstract, paragraphs 0012-0018, figures 1-3</td>
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<tr>
<td>A</td>
<td>CN 101017451 A (SHENZHEN SKYWORTH RGB ELECTRONIC CO., LTD.) 15 Aug. 2007 (15.08.2007) the whole document</td>
<td>1-16</td>
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Further documents are listed in the continuation of Box C.

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