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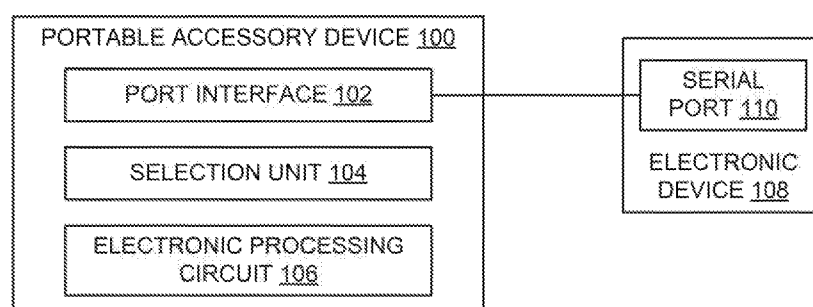


FIG. 1A

(57) Abstract: In one example, a portable accessory device includes a port interface to removably connect the portable accessory device to a serial port of an electronic device, a selection unit to receive a selection of an operating mode of the serial port, and an electronic processing circuit operably connected to the selection unit and the port interface. The electronic processing circuit may detect that the portable accessory device is connected to the electronic device and transmit a signal to configure the serial port of the electronic device to operate in one of a particular powered mode and an unpowered mode in accordance with the selection of the operating mode.



ACCESSORY DEVICES TO CONFIGURE SERIAL PORTS

BACKGROUND

[0001] Electronic devices may include ports that allow connection to an external peripheral device such as a modem, a barcode scanner, a credit card reader, a printer, and the like. An electronic device may include any suitable number of such ports, and each port may have a different function. One type of port is a serial port. A serial port may be setup to operate in an unpowered mode or in a powered mode. Any external peripheral device having a proper connector may be installed on the serial port whether or not the peripheral device is setup to operate in the unpowered mode or the powered mode.

BRIEF DESCRIPTION OF THE DRAWINGS

[0002] Examples are described in the following detailed description and in reference to the drawings, in which:

[0003] FIG. 1A is a block diagram of an example portable accessory device to configure a serial port of an electronic device in a particular powered mode or an unpowered mode;

[0004] FIG. 1B is a block diagram of the example portable accessory device of FIG. 1A, depicting additional features;

[0005] FIG. 2 is a block diagram of an example electronic device, including a serial port controller to setup a serial port of the electronic device to operate in a particular powered mode or an unpowered mode;

[0006] FIG. 3 is a schematic diagram of an example portable accessory device to generate and transmit a signal to configure a serial port of an electronic device;

[0007] FIG. 4 is an example system depicting an external accessory device connected to an electronic device to configure a serial port of the electronic device;

[0008] FIG. 5A is an example flow diagram implemented by an external accessory device for transmitting a signal to configure a serial port of an electronic device in accordance with a selection of an operating mode;

[0009] FIG. 5B is an example flow diagram implemented by the electronic device as in FIG. 5A, for configuring the serial port based on the signal received from the external accessory device; and

[0010] FIG. 6 is a block diagram of an example electronic device including a non-transitory machine-readable storage medium, storing instructions to configure a serial port of the electronic device based on a power configuration setting.

DETAILED DESCRIPTION

[0011] Electronic devices may be equipped with serial ports that allow connection to an external peripheral device/serial device like a modem, a credit card reader, a printer, or the like. A serial port may be configured to operate in an unpowered mode, a +5 volt powered mode, a +12 volt powered mode, or the like. Any suitable peripheral device, however, may be installed on the serial port whether or not the peripheral device is configured to operate in the unpowered mode or the powered mode. When the serial port is in the powered mode, the peripheral device that does not require power cannot be connected into the powered serial port as the peripheral device may be damaged. In such scenarios, when the peripheral device does not require power from the electronic device, the serial port can be changed to the unpowered mode. Similarly, when the peripheral device requires power from the electronic device, the serial port can be changed to the powered mode.

[0012] Some example ways to configure the serial ports (e.g., pin 1 and pin 9 power settings of a 9-pin serial port) is to use mechanical switches or jumpers in the electronic devices. In some examples, the mechanical switches or jumpers may not be exposed outside so as to maintain the aesthetic appearance. In such cases, to change the serial port mode, the electronic device may need to be shut down, electronic device's cover may need to be removed, and the jumpers may need to be changed (e.g., to set different pin 1 and pin 9 power setting). When an electronic device has four configurable serial ports that use two jumpers per serial port, a

user could possibly need to move eight jumpers to reconfigure all four serial ports. In some electronic devices, the manufacturer pre-configures the ports to be powered or not powered by performing the same process. Such type of configuring the serial ports between the powered mode and the unpowered mode can be complex and may need knowledge of the internal electronics of the electronic device.

[0013] In some other examples, the switches or jumpers may be exposed to users through openings in the electronic devices. However, in such cases, the user may accidentally change the jumper's location, which can damage the attached peripheral devices. In addition, the switches or jumpers that are exposed to the users may affect the aesthetic appearance and design of the electronic devices. Also, the switches or jumpers that are integrated into the electronic devices may occupy a significant amount of space.

[0014] Examples described herein may provide a portable accessory device that can be removably connected to serial ports to configure the serial ports. Examples described herein may facilitate to configure the serial ports (e.g., serial port pin 1 and pin 9 voltage settings) without disassembling the electronic device. The portable accessory device can be reused to configure any number of serial ports. Hence, the switches or jumpers on the electronic devices can be removed, which can save space and cost associated with the multiple switches or jumpers. Also, examples described herein may not affect or enhance the aesthetic appearance and design of the electronic devices.

[0015] In the following description, for purposes of explanation, numerous specific details are set forth in order to provide a thorough understanding of the present techniques. It will be apparent, however, to one skilled in the art that the present apparatus, devices and systems may be practiced without these specific details. Reference in the specification to "an example" or similar language means that a particular feature, structure, or characteristic described is included in at least that one example, but not necessarily in other examples.

[0016] An “operable connection”, or a connection by which entities are “operably connected”, is one in which signals, physical communications, and/or logical communications may be sent and/or received. An operable connection includes a physical interface, an electrical interface, and/or a data interface, but it is to be noted that an operable connection may include differing combinations of these or other types of connections sufficient to allow operable control. For example, two entities can be operably connected by being able to communicate signals to each other directly or through one or more intermediate entities like a processor, operating system, a logic, software, or other entity. Logical and/or physical communication channels can be used to create an operable connection.

[0017] The terms “portable accessory device” and “external accessory device” are used interchangeably throughout the document. The term “signal”, as used herein, may include but is not limited to one or more electrical or optical signals, analog or digital signals, data, one or more computer or processor instructions, messages, a bit or bit stream, or other means that can be received, transmitted and/or detected.

[0018] Examples described herein may provide a portable accessory device that can be removably connectable to a serial port of an electronic device. Further, the portable accessory device may receive a selection of an operating mode of the serial port, for instance, via switches or jumpers. Upon connecting the portable accessory device to the electronic device, the portable accessory device may transmit a signal to configure the serial port of the electronic device to operate in a particular powered mode or an unpowered mode in accordance with the selection of the operating mode. In this example, a serial port controller on the electronic device may setup the serial port to operate in the particular powered mode or the unpowered mode via two general purpose outputs (GPOs) based on the signal.

[0019] Turning now to the figures, FIG. 1A is a block diagram of an example portable accessory device 100 to configure a serial port 110 of an electronic device 108 to operate in a particular powered mode or an unpowered mode. In one example, portable accessory device 100 may be an external device that can be removably connectable to electronic device 108 via serial port 110. Example

electronic device 108 may be a Retail Point of Sale (RPOS) system for use in a retail environment. Electronic device 108 may include serial port 110 that allows connection to an external peripheral device such as a modem, a barcode scanner, a credit card reader, a printer, and the like depending on the configured powered mode.

[0020] Portable accessory device 100 may include a port interface 102 to removably connect portable accessory device 100 to serial port 110 of electronic device 108. For example, serial port 110 of electronic device 108 may be a male interface which can be directly connected to a female interface (e.g., a port interface 102) of portable accessory device 100.

[0021] Further, portable accessory device 100 may include a selection unit 104 to receive a selection of an operating mode of serial port 110. In one example, selection unit 104 may include a user selectable switch to receive the selection of the operating mode. For example, selection unit 104 may include two single pole, double throw (SPDT) switches which can be configured up to four modes. In this example, each SPDT switch may have a single input and can connect to and switch between two outputs. In other examples, selection unit 104 may include a dual in-line package (DIP) switch, which may include a set of manual electrical switches. In yet another example, selection unit 104 may include a user interface to receive the selection of the operating mode. Example user interface may be a graphical user interface, a touch screen, a button, and/or the like. For example, the graphical user interface may allow a user to programmatically select the operating mode.

[0022] Furthermore, portable accessory device 100 may include an electronic processing circuit 106 operably connected to selection unit 104 and port interface 102. In some examples, the components of portable accessory device 100 may be implemented in hardware, machine-readable instructions, or a combination thereof. In one example, electronic processing circuit 106 may be implemented as engines or modules comprising any combination of hardware and programming to implement the functionalities described herein.

[0023] During operation, electronic processing circuit 106 may detect that portable accessory device 100 may be connected to electronic device 108. Further, electronic processing circuit 106 may transmit a signal to configure serial port 110 of electronic device 108 to operate in the particular powered mode or the unpowered mode in accordance with the selection of the operating mode. In one example, the signal may configure serial port 110 to operate in one of an unpowered mode, a +5 volt powered mode, a +12 volt powered mode, or a reserved powered mode (e.g., +9 volt powered mode) depending on the selection of the operating mode via selection unit 104.

[0024] FIG. 1B is a block diagram of example portable accessory device 100 of FIG. 1A, depicting additional features. For example, similarly named elements of FIG. 1B may be similar in structure and/or function to elements described with respect to FIG. 1A. As shown in FIG. 1B, portable accessory device 100 may include a power circuit 152 for powering portable accessory device 100. In one example, port interface 102 may provide an electrical power supply to power circuit 152 via electronic device 108 for powering portable accessory device 100. In this example, portable accessory device 100 may draw power from electronic device 108 via port interface 102 when portable accessory device 100 is connected to electronic device 108. Alternatively, portable accessory device 100 may include a battery 154 to provide the electrical power supply to power circuit 152 for powering portable accessory device 100, i.e., portable accessory device 100 can be battery operated.

[0025] FIG. 2 is a block diagram of an example electronic device 200, including a serial port controller 212 to setup a serial port 202 of electronic device 200 to operate in a particular powered mode or an unpowered mode. In one example, electronic device 200 may be implemented as an RPOS system for use in a retail environment. In other examples, electronic device 200 may be suitable for use in other environments. Electronic device 200 may include serial port 202, a ring indicator switch circuit 208, a data carrier detect switch circuit 210, and serial port controller 212. Serial port 202 may be communicatively coupled to serial port ring indicator switch circuit 208 and data carrier detect switch circuit 210 through a respective communication link.

[0026] In one example, serial port 202 may be an RS-232 serial port having a DB9 connector. Example serial port 202 may include 9 pins having following functions:

- Pin 1: Data Carrier Detect (DCD) or +5 volts or +12 volts
- Pin 2: Received Data (RXD)
- Pin 3: Transmitted Data (TXD)
- Pin 4: Data Terminal Ready (DTR)
- Pin 5: Signal Ground (SG)
- Pin 6: Data Set Ready (DSR)
- Pin 7: Request to Send (RTS)
- Pin 8: Clear to Send (CTS)
- Pin 9: Ring Indicator (RI) or +5 volts or +12 volts.

[0027] In the following examples, the serial port is described with reference to the 9-pin serial port connector, however, examples described herein can also be implemented with other serial ports having different types of connectors and different numbers of pins.

[0028] Serial port 202 may include a ring indicator pin 204 (e.g., pin 9) and a data carrier detect pin 206 (e.g., pin 1). In this example, ring indicator switch circuit 208 may be connected to ring indicator pin 204 and data carrier detect switch circuit 210 may be connected to data carrier detect pin 206. Further, serial port controller 212 may be operably connected to serial port 202, ring indicator switch circuit 208, and data carrier detect switch circuit 210. For example, pin 9 (i.e., ring indicator pin 204) of serial port 202 can be operably connected to ring indicator switch circuit 208 to indicate whether a ring signal is received on pin 9. Data carrier detect switch circuit 210 can be operably connected to pin 1 (i.e., data carrier detect pin 206) of serial port 202 to notify when a carrier is detected on pin 1. Ring indicator function and the data carrier detect function are examples of signal processing functions. Other types of functions can be provided and the example systems and methods described herein are not limited to the example functions and/or example pin connections.

[0029] During operation, serial port controller 212 may detect an external accessory device 214 connected to serial port 202. External accessory device 214 may be used to configure serial port 202 to operate in one of an unpowered mode, a +5 volt powered mode, a +12 volt powered mode, and the like. Further, serial port controller 212 may obtain a power configuration setting of serial port 202 from external accessory device 214. Furthermore, serial port controller 212 may setup serial port 202 to operate in the powered mode (e.g., a +5 volt powered mode, a +12 volt powered mode, or the like) or the unpowered mode in accordance with the power configuration setting. In some examples, serial port controller 212 may operate using logic as explained in FIG. 3.

[0030] FIG. 3 is a schematic diagram of an example portable accessory device 300 to generate and transmit a signal to configure a serial port 312 of an electronic device 310. As shown in FIG. 3, portable accessory device 300 may include a port interface 302 to connect portable accessory device 300 to serial port 312 of electronic device 310. Further, portable accessory device 300 may include a first switch 304 and a second switch 306 to facilitate selection of an operating mode of serial port 312. Example first switch 304 and second switch 306 may include, but not limited to, SPDT switches.

[0031] Further, portable accessory device 300 may include an electronic processing circuit 308 operably coupled to port interface 302, first switch 304 and second switch 306. Electronic processing circuit 308 may be similar in structure and/or function to electronic processing circuit 106 of FIGs. 1A and 1B. During operation, electronic processing circuit 308 may determine the selection of the operating mode based on a state of first switch 304 and second switch 306 (e.g., via general purpose inputs GPI 1 and GPI 2). In one example, first switch 304 and second switch 306 may facilitate a maximum of 4 states by pulling up or down the controls provided on first switch 304 and second switch 306.

[0032] Further, electronic processing circuit 308 may generate a signal to configure serial port 312 to operate in one of a +5 volt powered mode, a +12 volt powered mode, a reserved powered mode, and an unpowered mode in accordance with the selection. Example reserved powered mode may be used to

accommodate any other voltage specifications such as a +9 volt powered mode or the like. Furthermore, electronic processing circuit 308 may transmit the signal to a serial port controller of electronic device 310. The serial port controller may configure serial port 312 based on the signal. An example operation to setup a serial port is explained in FIG. 4.

[0033] FIG. 4 is an example system 400 depicting an external accessory device 402 connected to an electronic device 414 to configure a serial port 416 of electronic device 414. External accessory device 402 may include a port interface 404 (e.g., a female serial port) connected to serial port 416 (e.g., a male serial port) of electronic device 414. Port interface 404 may include a first pin 406A and a ninth pin 406B. Further, external accessory device 402 may include two user selectable switches 408A and 408B, such as SPDT switches. In one example, two SPDT switches (e.g., 408A and 408B) may be placed on external accessory device 402, which can provide a maximum of 4 modes by pulling the SPDT switches up or down. Example modes can be an unpowered mode, a +5 volt powered mode, a +12 volt powered mode, and a reserved mode (e.g., +9 volt powered mode or any other powered mode).

[0034] Furthermore, external accessory device 402 may include an electronic processing circuit 412 connected to port interface 404 and user selectable switches 408A and 408B. Also, external accessory device 402 may include a power circuit 410. In one example, port interface 404 may provide an electrical power supply to power circuit 410 via electronic device 414 for powering external accessory device 402. For example, electronic processing circuit 412 may operate external accessory device 402 using the power supplied from electronic device 414. In this example, the power supplied from electronic device 414 may be received, via a receive data (RXD) pin of port interface 404, from a transmit data (TXD) pin of serial port 416.

[0035] Further, electronic processing circuit 412 may receive a power option requirement from user selectable switches 408A and 408B via general purpose inputs (e.g., GPI 1 and GPI 2). Further, electronic processing circuit 412 may communicate with serial port 416 of electronic device 414 via serial port signals

(e.g., RXD, TXD, and GND) to transmit a power option requirement to serial port 416 based on the selected mode. In one example, electronic processing circuit 412 may transmit the power option requirement in the form of a signal, via a TXD pin of port interface 404, to a RXD pin of serial port 416.

[0036] As shown in FIG. 4, electronic device 414 may include serial port 416 including a first pin 418A and a ninth pin 418B. Electronic device 414 may include a ring indicator switch circuit 420 connected to ninth pin 418B and data carrier detect switch circuit 422 connected to first pin 418A. In some examples, ring indicator switch circuit 420 may provide a ring indicator function in the unpowered mode and data carrier detect switch circuit 422 may provide data carrier detect function in the unpowered mode. In the powered mode, ring indicator switch circuit 420 and data carrier detect switch circuit 422 may switch to supply power (e.g., +5 volts or +12 volts) to serial port 416 via ninth pin 418B and first pin 418A, respectively.

[0037] Further, electronic device 414 may include a power switch circuit 424 electrically coupled to first pin 418A and ninth pin 418B via respective one of data carrier detect switch circuit 422 and ring indicator switch circuit 420. In one example, serial port 416 may be electrically coupled to power switch circuit 424 through a pin 1 signal path 428 and a pin 9 signal path 430. Power switch circuit 424 may be electrically coupled to a +12 volt power supply 432 through a signal path 434 and to a +5 volt power supply 436 through a signal path 438. In one example, +12 volt power supply 432 and +5 volt power supply 436 may be provided by a power supply (VCC).

[0038] Further, electronic device 414 may include a serial port controller 426 coupled to serial port 416, power switch circuit 424, ring indicator switch circuit 420, and data carrier detect switch circuit 422. Example serial port controller 426 may be an embedded controller. Example embedded controller may be an embedded keyboard controller. In some examples, the components of electronic device 414 may be implemented in hardware, machine-readable instructions, or a combination thereof. In one example, serial port controller 426 may be implemented as engines or modules comprising any combination of hardware and programming to

implement the functionalities described herein. In one example, serial port controller 426 may be integrated in a single semiconductor chip. In another example, serial port controller 426 and power switch circuit 424 may be integrated in a single semiconductor chip.

[0039] During operation, serial port controller 426 may obtain the power configuration setting from external accessory device 402, for instance, via the RXD pin (e.g., pin 2) and a signal path RXD. Further, serial port controller 426 may pass one of +5 volts and +12 volts to serial port 416 via power switch circuit 424 based on the power configuration setting obtained from external accessory device 402.

[0040] In one example in the unpowered mode, data carrier detect switch circuit 422 may pass the data carrier detect signal to pin 1 signal path 428 and ring indicator switch circuit 420 may pass the ring indicator signal to pin 9 signal path 430. In one example in the +5 volt powered mode, serial port controller 426 may pass seven serial communication signals to serial port 416 and power switch circuit 424 may supply +5 volts from +5 volt power supply 436 to serial port 416 through pin 1 418A and pin 9 418B (i.e., via pin 1 signal path 428 and pin 9 signal path 430). In one example in the +12 volt powered mode, serial port controller 426 may pass seven serial communication signals to serial port 416 and power switch circuit 424 may supply +12 volts to serial port 416 through pin 1 418A and pin 9 418B (e.g., via pin 1 signal path 428 and pin 9 signal path 430).

[0041] In one example, serial port controller 426 may generate a first control signal and a second control signal based on the power configuration setting obtained from external accessory device 402 and provide the first control signal and the second control signal to power switch circuit 424 via a GPO 1 and a GPO 2, respectively. Also, serial port controller 426 may provide the first control signal and the second control signal to ring indicator switch circuit 420 and data carrier detect switch circuit 422 via GPO 2 and GPO 1, respectively. Serial port controller 426 may set and maintain the first control signal and the second control signal for the selected mode. The first control signal and the second control signal may cause power switch circuit 424, data carrier detect switch circuit 422, and ring indicator switch circuit 420 to pass the serial communication signals to the first pin and the

ninth pin, provide +5 volts to the first pin and the ninth pin, or provide +12 volts to the first pin and the ninth pin.

[0042] In one example, serial port controller 426 can use two GPOs (GPO 1 and GPO 2) to configure a maximum of four power options and select different power options to first pin 418A and ninth pin 418B of serial port 416. For example, both GPO 1 and GPO 2 can be set to logic low for the unpowered mode, GPO 1 can be set to logic low and GPO 2 can be set to logic high for a first powered mode (e.g., reserved mode or +9 volt powered mode), GPO 1 can be set to logic high and GPO 2 can be set to logic low for a second powered mode (e.g., +12 volt powered mode), and both GPO 1 and GPO 2 can be set to logic high for a third powered mode (e.g., +5 volt powered mode). Alternatively, any other types of signals can be used for the first and second control signals. Once external accessory device 402 is inserted into electronic device 414, serial port controller 426 may change GPO states based on the power option requirement read from external accessory device 402. In some examples, external accessory device 402 may be powered via the TXD pin (e.g., pin 3) of serial port 416 and a signal path TX.

[0043] The first control signal and the second control signal may cause power switch circuit 424, data carrier detect switch circuit 422, and ring indicator switch circuit 420 to pass the serial communication signals (e.g., ring indicator signals and data carrier detect signals) to the first pin and the ninth pin, provide +5 volts to the first pin and the ninth pin, provide +12 volts to the first pin and the ninth pin, or the like. Once serial port 416 is configured, external accessory device 402 can be disconnected and a peripheral device such as a modem, a barcode scanner, a credit card reader, a printer, and the like can be connected to serial port 416. In this manner, serial port 416 can be configured without having to open electronic device 414 and manually set selected jumpers in electronic device 414 to configure serial port 416.

[0044] Electronic device (e.g., electronic device 200 and 414 of FIGs. 2 and 4, respectively) may include computer-readable storage medium comprising (e.g., encoded with) instructions executable by a processor to implement functionalities

described herein in relation to FIGs. 2 and 4. In some examples, the functionalities described herein, in relation to instructions to implement functions of components of electronic device 200 or 414 and any additional instructions described herein in relation to the storage medium, may be implemented as engines or modules comprising any combination of hardware and programming to implement the functionalities of the modules or engines described herein. The functions of components of electronic device 200 or 414 may also be implemented by a respective processor. In examples described herein, the processor may include, for example, one processor or multiple processors included in a single device or distributed across multiple devices.

[0045] FIG. 5A is an example flow diagram 500A implemented by an external accessory device for transmitting a signal to configure a serial port of an electronic device in accordance with a selection of an operating mode. FIG. 5B is an example flow diagram 500B implemented by the electronic device as in FIG. 5A, for configuring the serial port based on the signal received from the external accessory device. It should be understood that the processes depicted in FIGs. 5A and 5B represent generalized illustrations, and that other processes may be added, or existing processes may be removed, modified, or rearranged without departing from the scope and spirit of the present application. In addition, it should be understood that the processes may represent instructions stored on a computer-readable storage medium that, when executed, may cause a processor to respond, to perform actions, to change states, and/or to make decisions. Alternatively, the processes may represent functions and/or actions performed by functionally equivalent circuits like analog circuits, digital signal processing circuits, application specific integrated circuits (ASICs), or other hardware components associated with the system. Furthermore, the flow charts are not intended to limit the implementation of the present application, but rather the flow charts illustrate functional information to design/fabricate circuits, generate machine-readable instructions, or use a combination of hardware and machine-readable instructions to perform the illustrated processes.

[0046] As shown in FIG. 5A, at 502, a required power setting may be selected on a portable accessory device via user selectable switches such as a pair of

SPDT switches. The required power setting may be associated with the serial port of the electronic device and may include 0V, 5V, 9V, 12V, or the like. At 504, the portable accessory device may be connected to the serial port of the electronic device. At 506, a signal to configure the serial port of the electronic device to operate in a particular powered mode (e.g., a +5 volt powered mode, a +12 volt powered mode, or the like) or an unpowered mode may be generated and transmitted to the electronic device based on the required power setting.

[0047] As shown in FIG. 5B, at 552, a communication may be established between a serial port controller of the electronic device and an electronic processing circuit of the portable accessory device, upon connecting the portable accessory device to the electronic device. At 554, the required power setting of the serial port may be obtained from the portable accessory device by the serial port controller. At 556, a control signal may be generated by the serial port controller to change two GPO states to switch a specified voltage to the serial port based on the obtained power setting. For example, the specified voltage may be 0V, 5V, 9V, 12V, or the like.

[0048] FIG. 6 is a block diagram of an example electronic device 600 including a non-transitory machine-readable storage medium 604, storing instructions to configure a serial port of electronic device 600 based on a power configuration setting. Electronic device 600 may include a processor 602 and machine-readable storage medium 604 communicatively coupled through a system bus. Processor 602 may be any type of central processing unit (CPU), microprocessor, or processing logic that interprets and executes machine-readable instructions stored in machine-readable storage medium 604. Machine-readable storage medium 604 may be a random-access memory (RAM) or another type of dynamic storage device that may store information and machine-readable instructions that may be executed by processor 602. For example, machine-readable storage medium 604 may be synchronous DRAM (SDRAM), double data rate (DDR), rambus DRAM (RDRAM), rambus RAM, etc., or storage memory media such as a floppy disk, a hard disk, a CD-ROM, a DVD, a pen drive, and the like. In an example, machine-readable storage medium 604 may be a non-transitory machine-readable medium.

In an example, machine-readable storage medium 604 may be remote but accessible to electronic device 600.

[0049] As shown in FIG. 6, machine-readable storage medium 604 may store instructions 606-614. In an example, instructions 606-614 may be executed by processor 602 to configure the serial port of electronic device 600. Instructions 606 may be executed by processor 602 to detect an external accessory device connected to the serial port of electronic device 600.

[0050] Instructions 608 may be executed by processor 602 to establish a communication with an electronic processing circuit of the external accessory device to obtain a power configuration setting of the serial port. In one example, the power configuration setting of the serial port may be selected via the external accessory device that is removably connected to the serial port of electronic device 600.

[0051] Instructions 610 may be executed by processor 602 to generate a control signal to setup the serial port of electronic device 600 in accordance with the power configuration setting. Instructions 612 may be executed by processor 602 to apply power to the serial port when the control signal indicates a particular powered mode. Example particular powered mode may be a +5 volt powered mode or a +12 volt powered mode.

[0052] Instructions 614 may be executed by processor 602 to disconnect the power to the serial port and configure the serial port to process serial communication signals when the control signal indicates an unpowered mode. In one example, the serial port may include a ring indicator pin connected to a ring indicator switch circuit, the ring indicator switch circuit may pass a ring indicator signal to the serial port in the unpowered mode, and when the control signal is set for the particular powered mode, instructions may disconnect the ring indicator function.

[0053] In another example, the serial port may include a data carrier detect pin connected to a data carrier detect switch circuit, the data carrier detect switch

circuit may pass a data carrier signal to the serial port in the unpowered mode, and when the control signal is set for the powered mode, the instructions may disconnect the data carrier detect function. Thus, examples described in FIGs. 1-6 may configure the serial port to operate in an unpowered mode, a +5 volt powered mode, a +12 volt powered mode, or any other specified powered mode using an external accessory device without disassembling the electronic device.

[0054] It may be noted that the above-described examples of the present solution are for the purpose of illustration only. Although the solution has been described in conjunction with a specific implementation thereof, numerous modifications may be possible without materially departing from the teachings and advantages of the subject matter described herein. Other substitutions, modifications and changes may be made without departing from the spirit of the present solution. All of the features disclosed in this specification (including any accompanying claims, abstract, and drawings), and/or all of the steps of any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive.

[0055] The terms "include," "have," and variations thereof, as used herein, have the same meaning as the term "comprise" or appropriate variation thereof. Furthermore, the term "based on", as used herein, means "based at least in part on." Thus, a feature that is described as based on some stimulus can be based on the stimulus or a combination of stimuli including the stimulus.

[0056] The present description has been shown and described with reference to the foregoing examples. It is understood, however, that other forms, details, and examples can be made without departing from the spirit and scope of the present subject matter that is defined in the following claims.

WHAT IS CLAIMED IS:

1. A portable accessory device comprising:
 - a port interface to removably connect the portable accessory device to a serial port of an electronic device;
 - a selection unit to receive a selection of an operating mode of the serial port; and
 - an electronic processing circuit operably connected to the selection unit and the port interface, wherein the electronic processing circuit is to:
 - detect that the portable accessory device is connected to the electronic device; and
 - transmit a signal to configure the serial port of the electronic device to operate in one of a particular powered mode and an unpowered mode in accordance with the selection of the operating mode.
2. The portable accessory device of claim 1, wherein the signal is to configure the serial port to operate in one of the unpowered mode, a +5 volt powered mode, a +12 volt powered mode, and a reserved powered mode.
3. The portable accessory device of claim 1, further comprising a power circuit to power the portable accessory device.
4. The portable accessory device of claim 3, wherein the port interface is to provide an electrical power supply to the power circuit via the electronic device to power the portable accessory device.
5. The portable accessory device of claim 3, further comprising a battery to provide an electrical power supply to the power circuit to power the portable accessory device.
6. The portable accessory device of claim 1, wherein the selection unit comprises a user selectable switch to receive the selection of the operating mode.

7. The portable accessory device of claim 1, wherein the selection unit comprises a user interface to receive the selection of the operating mode.
8. An electronic device comprising:
 - a serial port including a ring indicator pin and a data carrier detect pin;
 - a ring indicator switch circuit connected to the ring indicator pin;
 - a data carrier detect switch circuit connected to the data carrier detect pin;and
 - a serial port controller operably connected to the serial port, the ring indicator switch circuit, and the data carrier detect switch circuit, wherein the serial port controller is to:
 - detect an external accessory device connected to the serial port;
 - obtain a power configuration setting of the serial port from the external accessory device; and
 - setup the serial port of the electronic device to operate in one of a particular powered mode and an unpowered mode in accordance with the power configuration setting.
9. The electronic device of claim 8, further comprising:
 - a power switch circuit, wherein the serial port controller is to pass one of +5 volts and +12 volts to the serial port via the power switch circuit based on the power configuration setting obtained from the external accessory device.
10. The electronic device of claim 9, wherein the power switch circuit is electrically coupled to a first pin of the serial port, a ninth pin of the serial port, and the serial port controller.
11. The electronic device of claim 10, wherein the serial port controller is to:
 - generate a first control signal and a second control signal based on the power configuration setting obtained from the external accessory device; and
 - provide the first control signal and the second control signal to the power switch circuit, the ring indicator switch circuit, and the data carrier detect switch circuit via a first general-purpose output (GPO) and a second GPO, respectively, the first control signal and the second control signal are to cause the power

switch circuit, the ring indicator switch circuit, and the data carrier detect switch circuit to pass serial communication signals to the first pin and the ninth pin, provide +5 volts to the first pin and the ninth pin, or provide +12 volts to the first pin and the ninth pin.

12. A portable accessory device comprising:

- a port interface to connect the portable accessory device to a serial port of an electronic device;

- a first switch and a second switch to facilitate selection of an operating mode of the serial port; and

- an electronic processing circuit operably coupled to the port interface, the first switch, and the second switch, wherein the electronic processing circuit is to:

- determine the selection of the operating mode based on a state of the first switch and the second switch;

- generate a signal to configure the serial port to operate in one of a +5 volt powered mode, a +12 volt powered mode, a reserved powered mode, and an unpowered mode in accordance with the selection; and

- transmit the signal to a serial port controller of the electronic device, wherein the serial port controller is to configure the serial port based on the signal.

13. The portable accessory device of claim 12, wherein the first switch and the second switch are single pole, double throw (SPDT) switches.

14. The portable accessory device of claim 12, wherein the electronic processing circuit is to operate the portable accessory device using power supplied from the electronic device, and wherein the power supplied from the electronic device is received, via a receive data (RXD) pin of the port interface, from a transmit data (TXD) pin of the serial port.

15. The portable accessory device of claim 12, wherein the electronic processing circuit is to transmit the signal, via a TXD pin of the port interface, to a RXD pin of the serial port.

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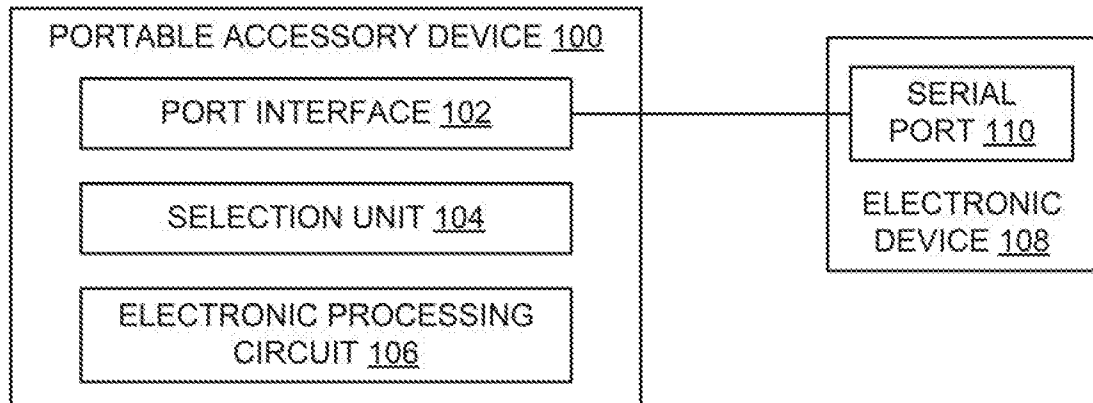


FIG. 1A

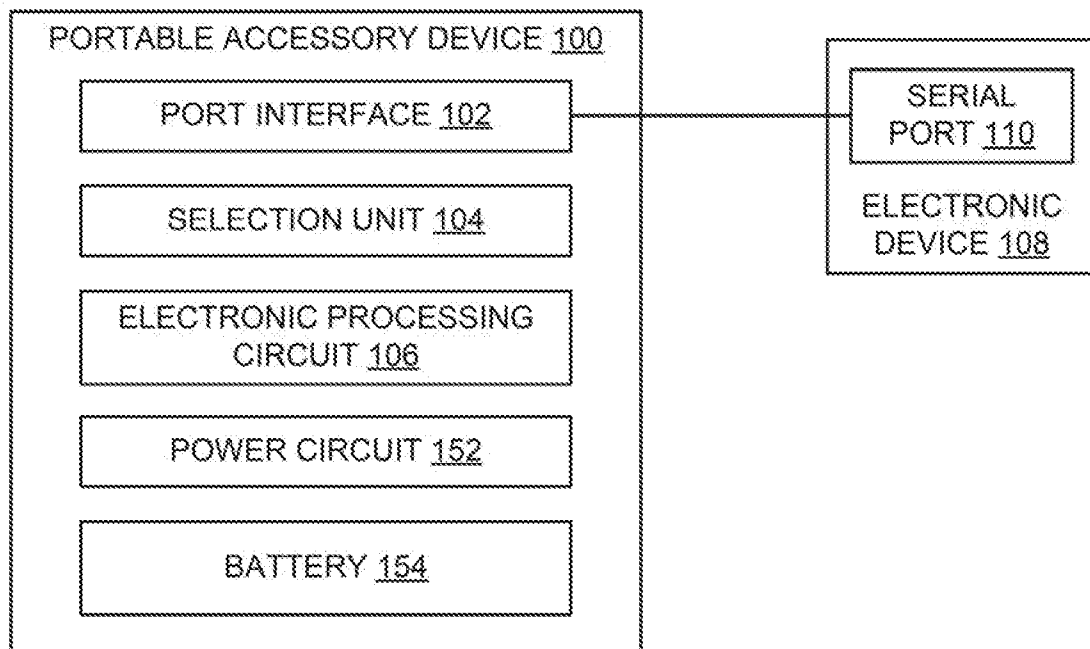


FIG. 1B

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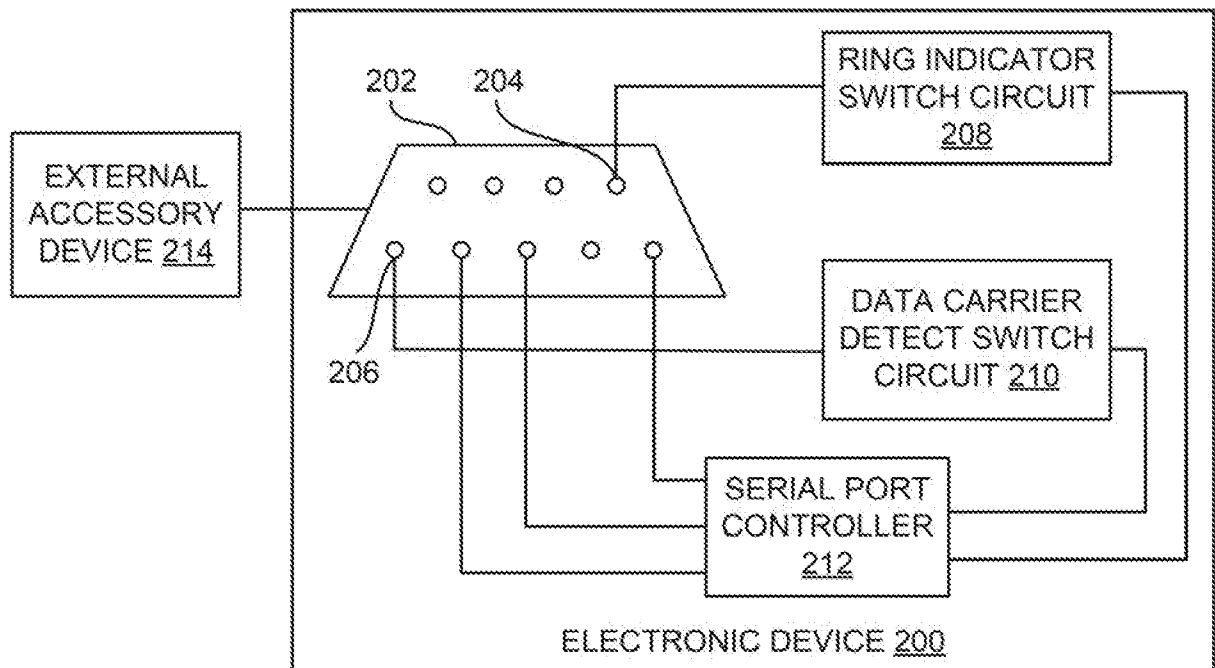


FIG. 2

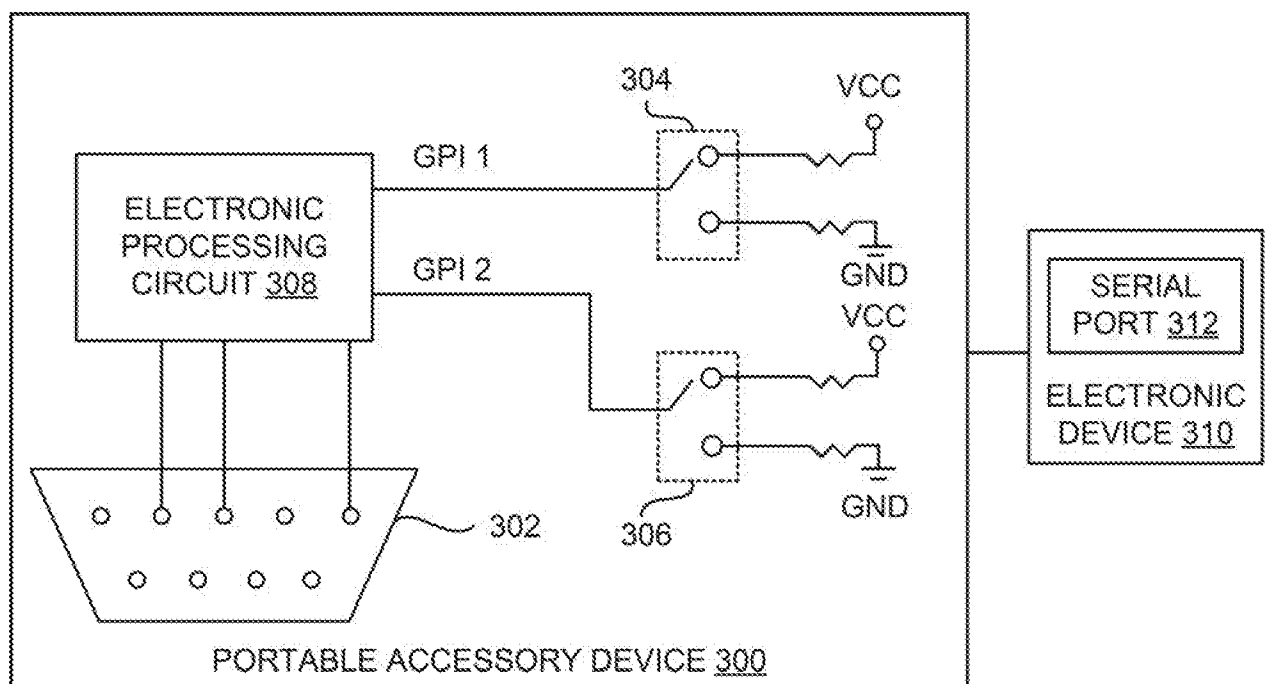


FIG. 3

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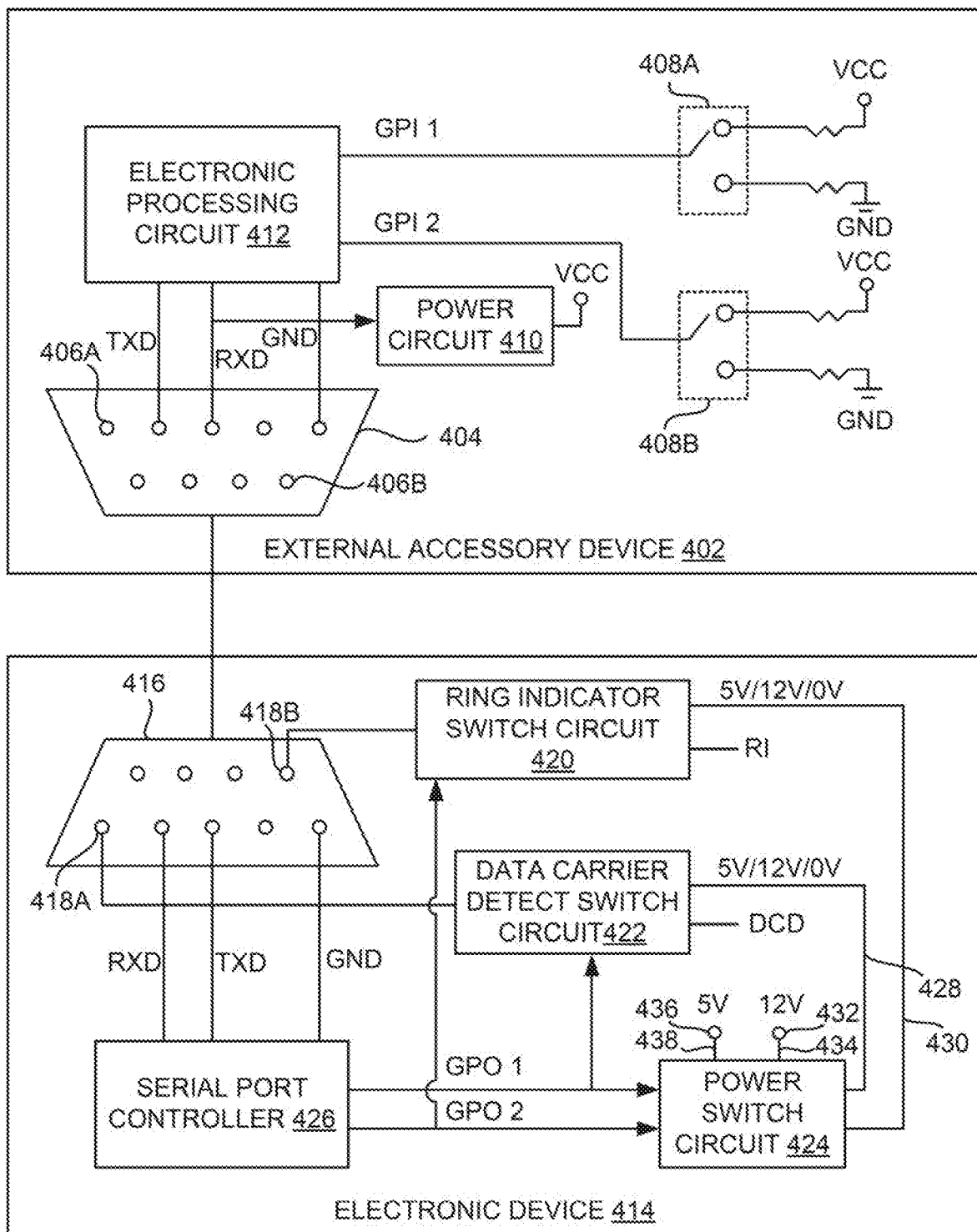


FIG. 4

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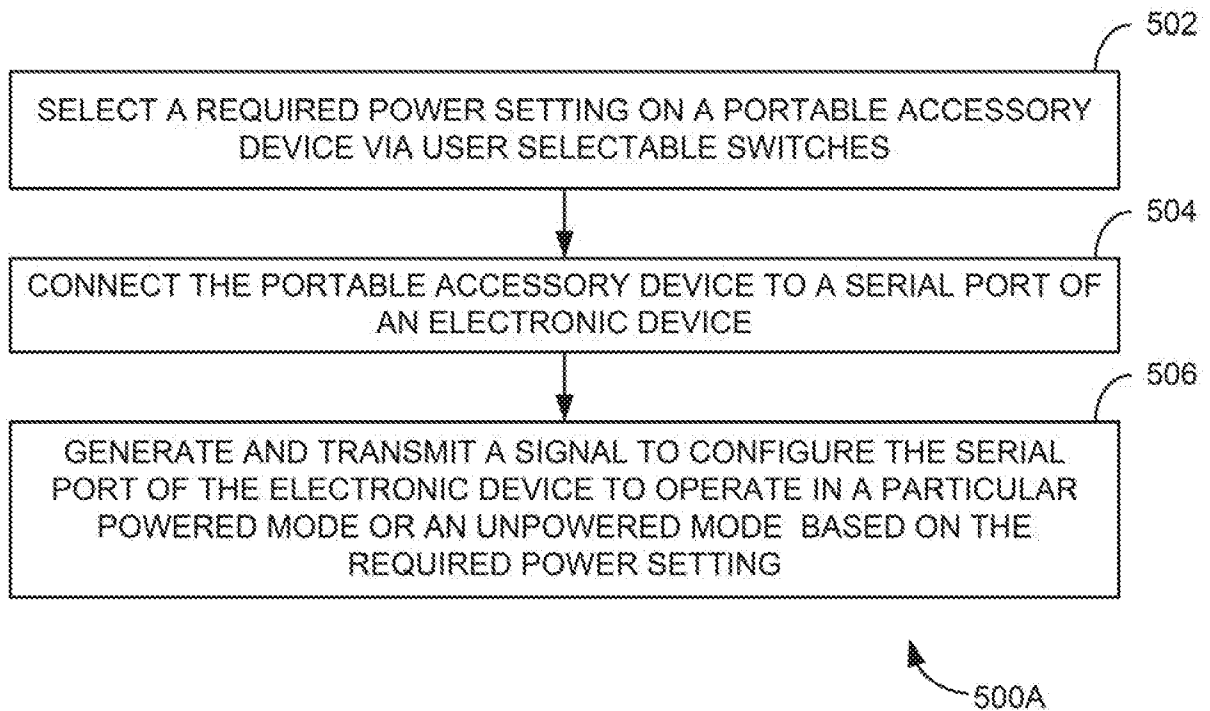


FIG. 5A

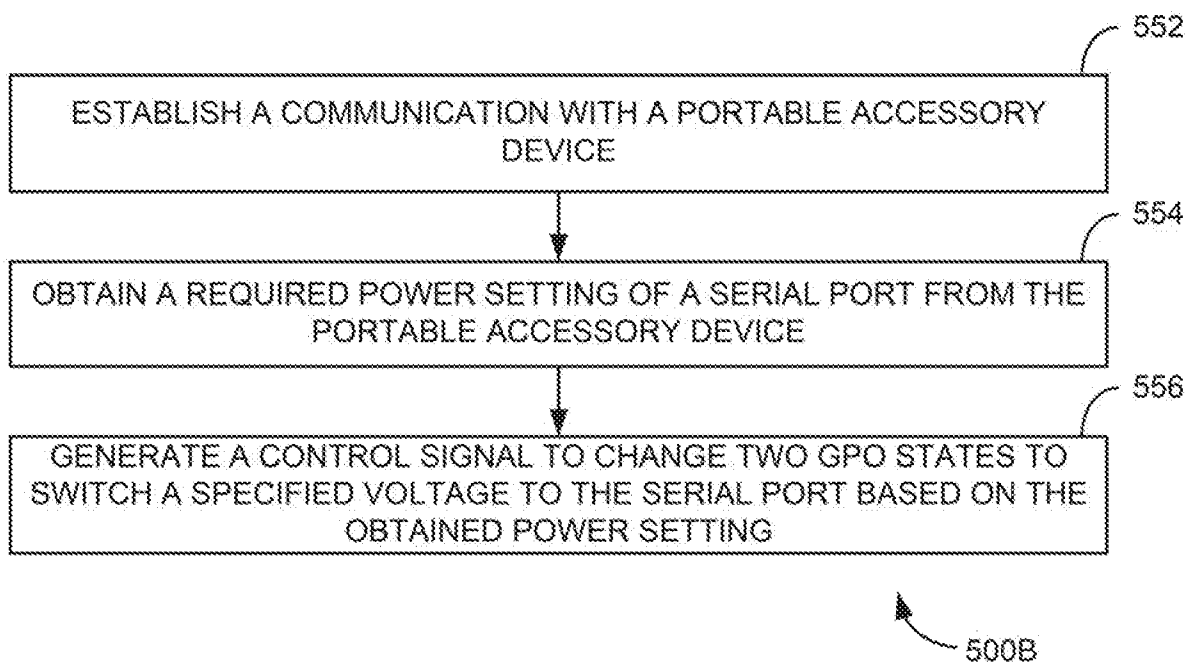


FIG. 5B

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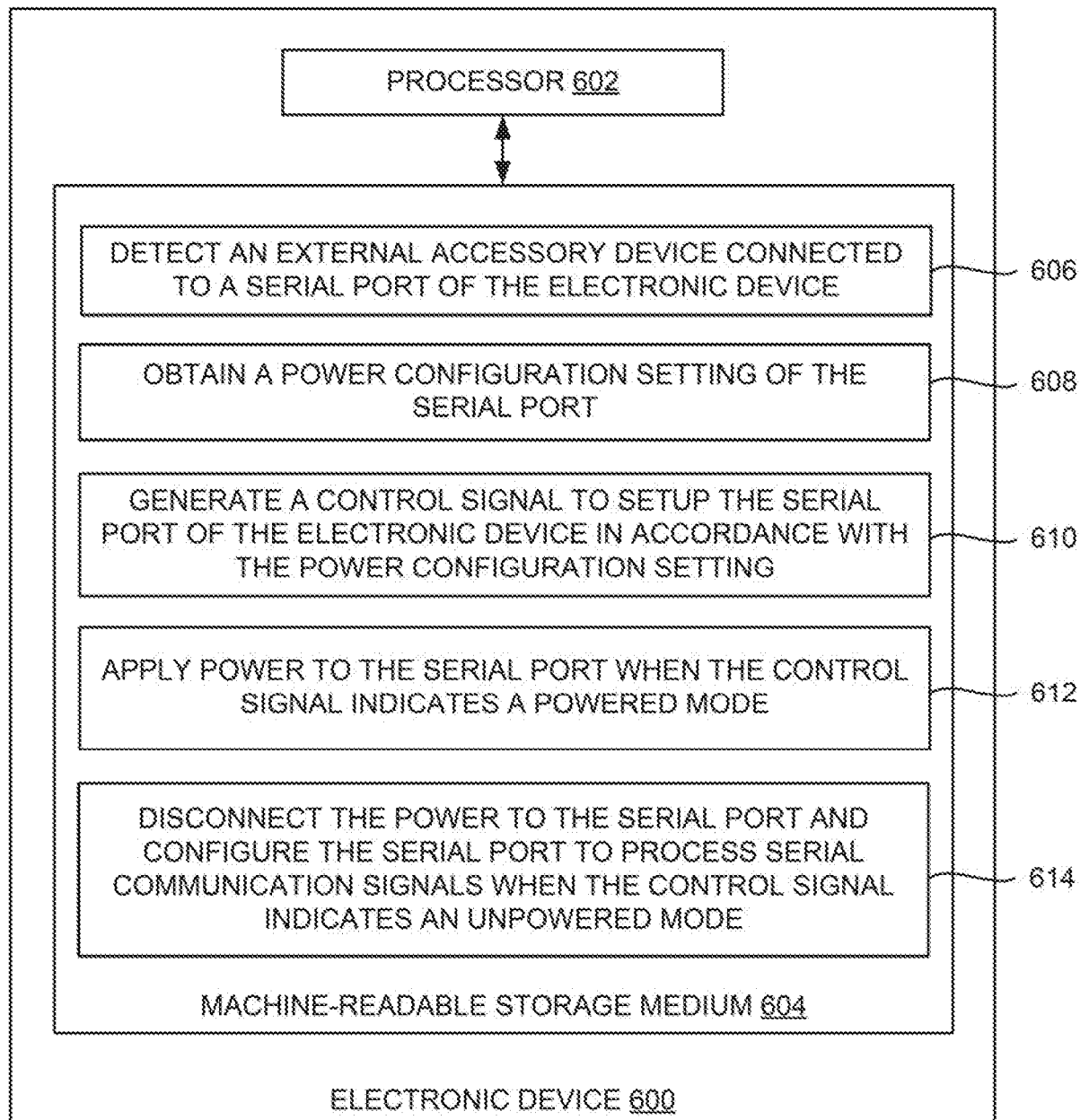


FIG. 6

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 2018/046153

A. CLASSIFICATION OF SUBJECT MATTER		
G06F 13/10 (2006.01) G06F 1/26 (2006.01) According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
G06F		
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)		
PatSearch (RUPTO internal), USPTO, PAJ, K-PION, Esp@cenet, Information Retrieval System of FIPS		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2011/0125930 A1 (MICROSOFT CORPORATION) 26.05.2011, paragraphs [0011], [0012], [0033], [0037], [0040]-[0043], [0049], [0050], [0057], [0061], [0062], [0065], [0067], [0083], [0103]	1-15
A	US 2013/0013936 A1 (GENESYS LOGIC, INC.) 10.01.2013	1-15
A	US 2013/0009864 A1 (SAMSUNG ELECTRONICS CO. LTD.) 10.01.2013	1-15
A	US 2011/0126005 A1 (MICROSOFT CORPORATION) 26.05.2011	1-15
☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.		
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"O" document referring to an oral disclosure, use, exhibition or other means		
"P" document published prior to the international filing date but later than the priority date claimed		
Date of the actual completion of the international search	Date of mailing of the international search report	
13 May 2019 (13.05.2019)	16 May 2019 (16.05.2019)	
Name and mailing address of the ISA/RU: Federal Institute of Industrial Property, Berezhkovskaya nab., 30-1, Moscow, G-59, GSP-3, Russia, 125993 Facsimile No: (8-495) 531-63-18, (8-499) 243-33-37	Authorized officer S. Finoshin Telephone No. (495) 531-65-15	