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(54) **INTERFACE DISTINGUISHING APPARATUS**

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(57) **ABSTRACT**

In order to determine, where a terminal device and a computer main frame are connected by a PS/2 interface or a USB interface, which interface is connected, the main frame and the terminal device monitor the states of two signal lines after the PS/2 or USB interface is connected to a port of the terminal device, and the interface is determined to be one for PS/2 use if the states are (H, H) or (H, L). If the states are (L, L), a distinguishing signal assigning section on the terminal device side turns on a switching means to give an H signal to the signal lines.

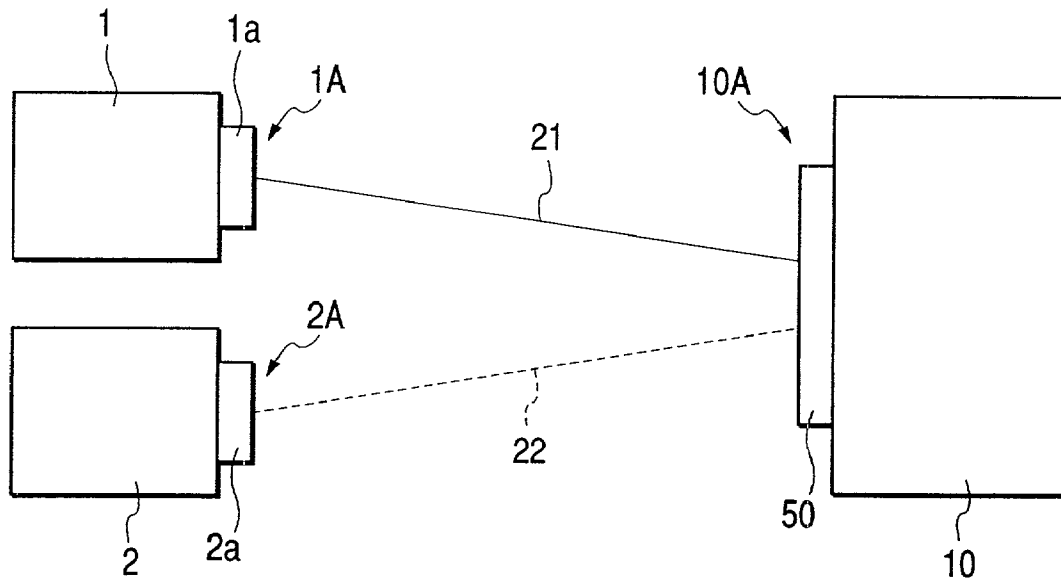
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*FIG. 1*

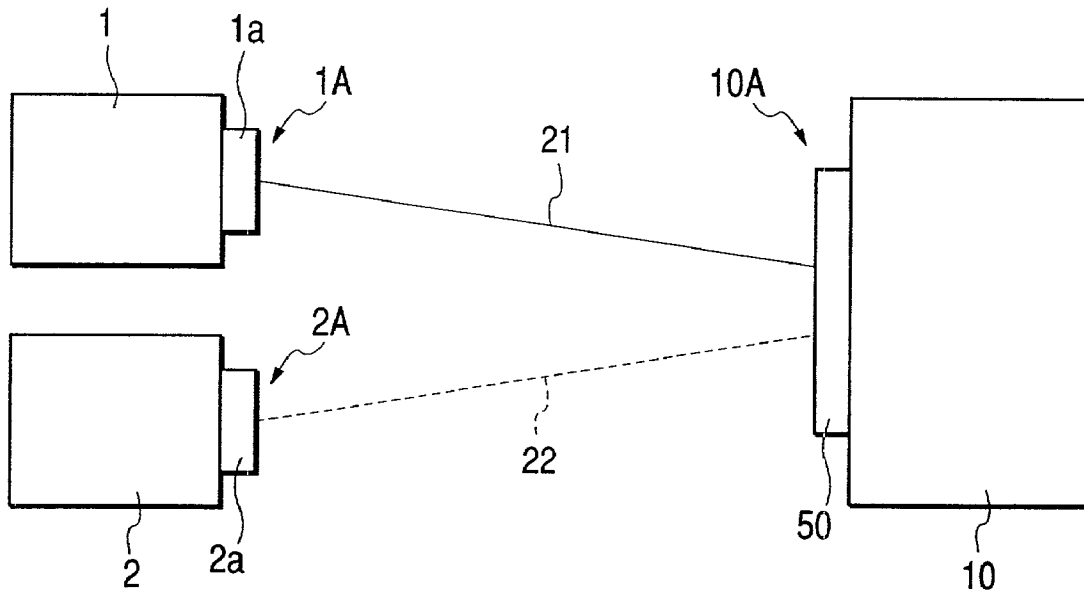


FIG. 2

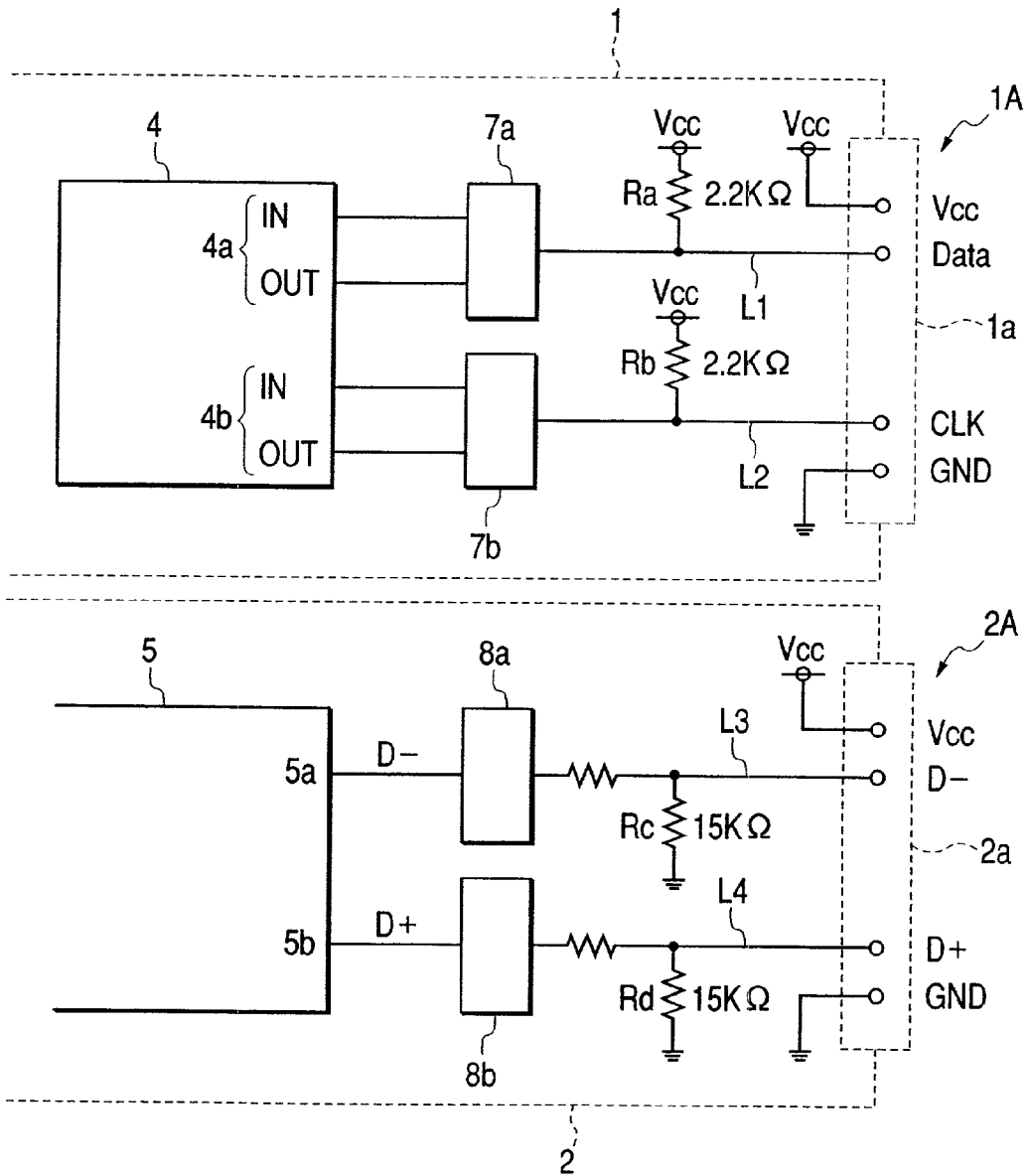
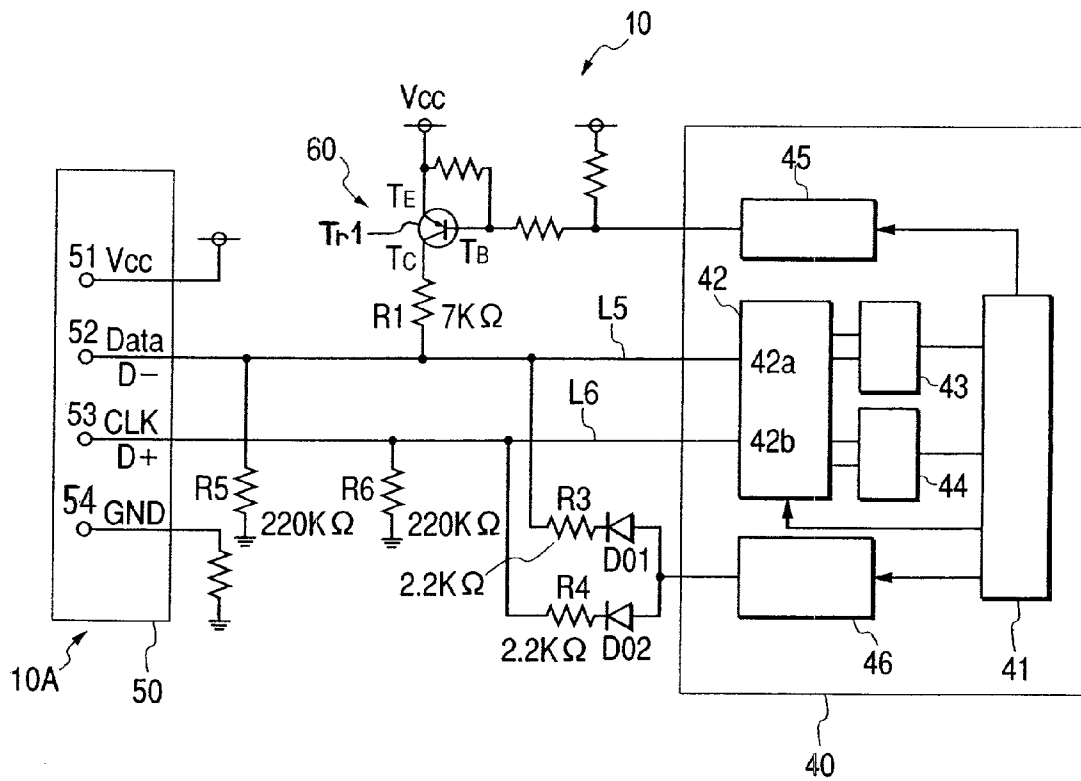


FIG. 3



## INTERFACE DISTINGUISHING APPARATUS

### BACKGROUND OF THE INVENTION

#### [0001] 1. Field of the Invention

[0002] The present invention relates to an interface distinguishing apparatus which, when a terminal device, such as a keyboard, to which, for instance, PS/2 and USB interfaces are connectable, is connected to a computer main frame via one of these interfaces, can automatically distinguish the type of interface via which the terminal device is connected.

#### [0003] 2. Description of the Related Art

[0004] Keyboards and mice are extensively used for inputting data to computers. With such a keyboard or a mouse, an interface known as a Personal System/2 (PS/2) is mainly used. In recent years, however, in place of PS/2 interfaces, different interfaces known as universal serial bus (USB) have come to be increasingly used with keyboards, mice or other peripheral devices.

[0005] If a PS/2 interface is to be used, it is connected to a PS/2 port provided in advance on a computer main frame or, if a USB interface is to be used, it is connected to a USB port.

[0006] However, in the above-described configuration, it is impossible to use a conventional PS/2 interface-compatible keyboard unit (the terminal device) if a PS/2 port ceases to be provided on the computer (the main frame), resulting in the inconvenience that a USB interface-compatible keyboard unit has to be newly purchased. To eliminate this inconvenience, there is available a keyboard unit provided with both a PS/2 interface and a USB interface. Where such a keyboard unit is used, it is necessary to determine on the keyboard unit side whether it is connected to the computer main frame via the PS/2 port or via the USB port.

[0007] Although the PS/2 interface and the USB interface are entirely different from each other in connector shape and data format, they have common features that power is supplied from the main system to the terminal device and that two signal lines are used.

[0008] Therefore, even if only a dedicated PS/2 port is provided on the terminal side, the use of a conversion cable would enable USB signals to be inputted and outputted via a dedicated PS/2 port, and there also is a keyboard unit which realizes a USB interfacing function by appropriately processing signals within the terminal.

[0009] In this case, however, it is necessary to determine on the keyboard unit side whether a dedicated PS/2 cable or a conversion cable is connected to the dedicated PS/2 port.

### SUMMARY OF THE INVENTION

[0010] The present invention is intended to solve this problem with the prior art, and the object of the present invention is to provide an interface distinguishing apparatus which enables both a computer main frame and a terminal device to automatically determine whether a PS/2 interface or a USB interface is connected by merely connecting a cable between the computer main frame and the terminal device.

[0011] According to the invention, there is provided an apparatus in which a terminal permitting data inputting/outputting via a first interface and data inputting/outputting via a second interface can be connected to both a first port for the first interface and a second port for the second interface on a main frame side, wherein:

[0012] both the first interface and the second interface have two signal lines each; the first port has a circuit which holds, when the combination of the potentials of the two signal lines is determined and the potential of one of the signal lines is varied, that potential; and the second port permits setting of diverse combinations of the potentials of the two signal lines including the combination of potentials of the first port and has a circuit which can return the varied potentials of the signal lines to their original potentials; and

[0013] there is provided a distinguishing means for varying on the terminal side, when a state in which the terminal is connected to either one of the ports or a state in which the power supply to the main frame is turned on after that connection is recognized on the terminal side and the potentials of the port are recognized to be the combination of potentials of the first interface, the potential of either signal line and determining whether the first port or the second port is used on the main frame side according to whether or not the varied potential is held.

[0014] According to the invention, even where, for instance, only a dedicated PS/2 input/output port is provided on the terminal side, inputting/outputting of USB standard signals is made possible by using a conversion cable, and it is possible to determine whether a PS/2 interface is connected by a dedicated PS/2 cable or a USB interface is connected via a conversion cable between the terminal and the computer main frame, or where both a PS/2 port and a USB port are provided on the terminal side, it is made possible to determine which interface is connected to which port.

[0015] Further according to the invention, not only in the case of connection of a cable but also in the case of turning-on of power supply, distinction can be carried out, so that stable communication can be ensured all the time.

[0016] There is provided on the terminal, for instance, a switching means for switching the potential of either signal line to H when a state in which the potentials of both signal lines of the first port are L and the terminal is connected to either port or a state in which power supply to the main frame is turned on is recognized on the terminal side after the connection and the potentials of both signal lines of the port are recognized to be L, and the distinguishing means identifies the first port if the potential of the signal line holds H or identifies the second port if the potential of the signal line returns to L.

[0017] It is preferable for the switching means in the foregoing to be positioned between resistors to pull up one of the signal lines and the power supply line.

[0018] Where, for instance, the two signal lines conform to the USB standard, it is necessary on the terminal side to pull up either signal line according to the data transfer speed.

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