USER INPUT APPARATUS, COMPUTER CONNECTED TO USER INPUT APPARATUS, METHOD OF CONTROLLING COMPUTER CONNECTED TO USER INPUT APPARATUS, AND STORAGE MEDIUM

TECHNICAL FIELD

[0001] The present invention relates to user input apparatuses used by the user to input commands and others to a computer, computers connected to the user input apparatuses and control methods for the computers connected to the user input apparatuses, and storage media, and more particularly, to user input apparatuses where the user performs input operations by using part of the user's body as with a keyboard or a mouse, computers connected to the user input apparatuses and control methods for the computers connected to the user input apparatuses, and storage media.

[0002] More specifically, the present invention relates to user input apparatuses designed such that the user operates the apparatuses by both hands, computers connected to the user input apparatuses and control methods for the computers connected to the user input apparatuses, and storage media, and more particularly, to user input apparatuses allowing the user to perform input operations without inconvenience even if the user cannot use one hand due to other work while the apparatuses are designed such that the user operates the apparatuses by both hands, computers connected to the user input apparatuses and control methods for the computers connected to the user input apparatuses, and storage media.

BACKGROUND ART

[0003] Due to recent technical innovations, general-purpose computer systems called workstations (WSs) and personal computers (PCs), which are relatively compact, low priced, highly valued added, and highly functioned, have been developed and made commercially available, and have been used in research organizations, such as universities and collages, and company offices, and further in daily life in ordinary houses. Nowadays, Most of daily work is related to computers, and many persons each spend a day touching a keyboard and a mouse.

[0004] Usually, the user use both hands to operate a keyboard. In some occasions, the user cannot use either of them.

[0005] When the user is operating a mouse, for example, the right hand (or the dominant hand) is on the mouse. When the user uses a telephone while operating a computer, the user cannot use a hand which is holding the handset to operate the keyboard.

[0006] Conventional keyboards are not designed for unfortunate cases in which the user cannot use either of the hands for operation. Therefore, one-hand difficult operations may be required, which largely reduces operability of computers.

[0007] When a key usually operated by the left hand is required to be operated by the right hand, or when it is required that a key disposed at a right-hand side be pressed while a control key or a shift key disposed at a left-hand side is being pressed, if one hand cannot be used due to other work, the input operation becomes difficult to perform or impossible.

[0008] Computer systems are generally driven in response to user input commands, and display processing results on display screens to provide an interactive processing environment. As a recent trend, conventional character-based user input environments using keyboards, that is, "CUIs (character user interfaces)", typical of which is a DOS (disk operating system) shell screen, have been changed to "GUIs (graphical user interfaces)", which have implemented graphics-based user inputs. In GUI environments, a desktop, which simulated a computer system, and a large number of icons are prepared on display screens.

[0009] On a desktop having a GUI, all resource objects, such as files, handled in a computer system are expressed by icons. The user applies straightforward operations (such as clicking and dragging and dropping) to the icons, which express programs, data, folders, devices, and others on the display screen, by using a mouse or others to displayed objects on the screen. In this way, computer operations can be intuitively performed. On the desktop, buttons, such as a menu bar and a tool box, for instantaneously calling various functions, that is, computer processing, are prepared. Command input forms have become more intuitive and easier to understand.

[0010] With the introduction of GUI environments, the user can appropriately operate a computer without learning the names of commands and a command operation method or performing troublesome key inputs.

[0011] As typical user input apparatuses which can be used in such GUI environments, there are coordinate specifying apparatuses, such as a mouse, a track point, a joystick, a tablet, and a touch sensitive pad. Among them, the mouse have been widely used in the computer industry, and most users are familiar with mouse operations typical of which is a drag and drop operation. It can be said that there is no need to perform training for mouse operations when a computer is newly introduced to an office or a house in daily life scene. GUIs based on mouse operations have already become established among many users, and provide a plurality of general-purpose functions.

[0012] In GUI environments, the user can interactively perform input operations to a computer in an easy-to-understand manner while guided by a content displayed on a computer screen. As a case in which such interactive inputs have further advanced, there is a user input apparatus using a touch sensitive panel. In this case, since a touch sensitive panel, which reads the coordinates of a point specified by a pen or the tip of a user's finger, is superposed on the screen, the user does not need to turn the user's eyes from the screen, unlike a case in which mouse operations are used. In addition, since the user can directly specify a desired displayed object by the tip of a user's finger, operability is further improved.

[0013] When a conventional touch sensitive panel is used for user inputs, however, the user needs to actually touch the surface of the touch sensitive panel by the tip of a user's finger.

[0014] If there are two or more contact points on the panel, the positions thereof cannot be independently measured. When a plurality of users are positioned around the touch sensitive panel in a meeting, for example, the tips of fingers of a plurality of participants may touch the touch sensitive