

[0060] It is an object of this invention to provide a pointing device that avoids the imposition of constant muscle tension in the hands, arms, or shoulders of the user by allowing the user to hold the pointing device in a neutral, relaxed position as much as possible.

[0061] It is an object of this invention to provide a pointing device that does not encourage placement on a desktop such that the user must lean forward, stretch or reach to use the pointing device.

[0062] It is an object of this invention to minimize the pressures localized to the wrist when using the pointing device.

[0063] These and other advantages of the present invention are apparent from the detailed description that follows.

BRIEF DESCRIPTION OF THE DISCLOSURE

[0064] The present invention takes the functionality of a mouse-type pointing device and places these functions in a pointing device that avoids the various demands on the user's body as described above. The net effect is to minimize the harmful, and repetitive shoulder, arm, hand or finger movements associated with the use of most computer pointing devices. The present invention is an entirely new pointing device that takes advantage of existing technologies to help avoid many irritating aches, pains, and ailments associated with other pointing devices. Rather than being slid around on a mouse pad or being restricted to desktop use, the present invention is designed to be used with the hand resting in the lap so that the hand, while the wrist and arm remain in a natural and comfortable stationary position.

[0065] In the present invention, the housing or shell of the device comprises an upright, rectangular portion that extends upward from a horizontal grip-shaped main body portion.

[0066] The upright portion of the device presents an x-y input sensor to the user. This x-y input sensor may be a trackball, touchpad or other device with similar function. The user holds the device by wrapping fingers around the main body portion with the thumb on top extending forward toward the upright portion of the device. The x-y input unit is controlled with light movements of the thumb tip. The index and middle fingers rest in grip-like channels on the bottom of the main body. (Note, the middle finger is sometimes called the second finger). These channels contain zero-force touch switches that act as left and right mouse buttons for the two fingers.

[0067] In a preferred embodiment of the invention, a third touch switch located near the thumb causes the first two touch switches function like a scroll wheel found on the typical modem computer mouse. Thus, the user can efficiently scroll through windowed computer applications. Electronic auditory or vibratory feedback alerts the user to touch switch activation thereby giving the zero-force switches a simulated tactile feel.

[0068] Also in the preferred embodiment, a unique wedge-shaped fin protrudes upward from the side of the main body of the device. This fin fits comfortably into the user's palm beneath the thumb to stabilize the device and to accommodate varying user hand sizes.

[0069] The present invention, hereinafter "pointing device" is best suited to graphically-oriented computer use wherein the "point", "click", "drag" and "scroll" operations associated with computer input devices consume more time than direct, keyboard text editing. Such uses may include graphically oriented programs for design, drafting, art, and programming. Other uses include, but are not limited to, operations with navigation and selection primarily by point and click, such as navigation and use of Internet sites and providing input applications such as web based television. For activities with significant input via the keyboard, a desktop mouse may be simultaneously connected through the computer's serial port or universal serial bus port for convenience, so that the hand does not need to move repetitively from lap to desktop and back.

[0070] As shown in **FIG. 1**, a hand placed in a lap naturally assumes a stress-free, open-grip posture with the thumb pointing forward at the top.

[0071] The pointing device makes the best of the body's natural tendencies. Its shape fits the contours of the hand when relaxed in the lap so that no joints or tendons are stressed. Use of the present invention allows the elbow to rest at a preferably obtuse angle close to the body without constantly having to reach for a desktop device. There is no stress to the wrist from over extending, and a more upright body posture is naturally encouraged. The arm and hand are supported comfortably in the lap to reduce the various stresses associated with holding mice, trackballs and touch pads that rest flat on a desktop. Since the device is operated from the lap, users are not adversely impacted by limited desk space.

BRIEF DESCRIPTION OF THE DRAWINGS

[0072] **FIG. 1** is an illustration of a user's hand in a stress-free, relaxed open grip posture.

[0073] **FIG. 2** shows a first embodiment of the present invention pointing device as held by a user.

[0074] **FIG. 3** shows the first embodiment of the present invention pointing device connected to a partial block diagram of a computer.

[0075] **FIG. 4** shows the underside of the first embodiment of the present invention to show two of the zero force touch switches.

[0076] **FIG. 5** shows the undesirable flexural motion of the thumb required to achieve vertical cursor motion with a trackball placed beneath the thumb pad.

[0077] **FIG. 6** illustrates the concept of pivotal motion of the straightened thumb translating to lateral motion of the thumb tip in contrast to the flexural motion of **FIG. 5**.

[0078] **FIG. 7** illustrates one embodiment of the present invention with input areas for edge motion surrounding a touchpad.

[0079] **FIG. 8** illustrates one embodiment of the present invention with edge motion buttons around a round touchpad.

[0080] **FIG. 9** illustrates one embodiment of the present invention with edge motion buttons around a trackball input device.