INPUT KEYBOARD APPARATUS FOR INFORMATION PROCESSING DEVICE AND OTHER KEYBOARD DEVICES

BACKGROUND OF THE PRESENT INVENTION

Input keyboards are used to input information into information processing and translating devices such as computers, typewriters, calculators and the like. The keyboard units have uniformly included support with the various input and control keys distributed in an appropriate planar array to present a convenient planar presentation of the individual keys. The keys for computers have been located within a standard cartesian matrix or format of column and rows of individual letters and numbers for many years, with the numbers arranged above the letters. The various interrelated control element keys are generally located in the cartesian matrix to the sides of the letter and number keys. Other devices such as calculators may have only numbers and mathematical function keys arranged in rows and columns.

With the great increase in the number and use of computers having input keyboards of the planar arrays, ergonomic considerations have become of great significance. The development of computing devices using standard type keyboards has particularly brought the user considerations into greater interest. Thus, schools are introducing children in third and fourth grades and earlier to calculators and computers, and teaching use application of such devices. Various game devices use computer-type keyboards and are used by children at very young ages. As students progress through school, the use of computers becomes greater and greater.

Interest in the ergonomic consideration has resulted in certain suggested variations in the standard keyboards.

A significant physical difficulty which with repetitive motion arises in connection with operators who operate at a keyboard over a long period of time, and particularly for long periods on any given day or successive days causes nerve damage known as carpal tunnel syndrome. The latter ailment is a disruptive and physically painful disorder in the operator's wrist as a result of the repetitive motion and orientation of the hands relative to the arm. The condition often requires medical attention and in severe cases can result in the incapacity of the operator for the normal work functions. In severe cases, the person may have to cease working resulting in workman compensation expenses or take a much lesser position with a loss of wages as well as significant medical expenditures. The cost in human suffering, lost time and medical costs associated with the problem is presently severe, and with the greater usage of computer keyboards by the ever increasing population, we can anticipate only create further and more severe problems.

U.S. Pat. No. 4,402,624 discloses a keyboard having an infinitely adjustable support for varying of the inclination or angle of the keyboard as present to the operator. As more fully discussed in the '624 patent, the inclination of the keyboard has been studied and an optimal angled support for an average operator determined with the keyboard generally so constructed. The fixed orientation is however optimal for those operators who conform to the average specification, and the '624 patent discloses an adjustable structure to permit individual adjustment for each operator. Studies relating to keyboard orientations have investigated the fore and aft inclination as well as possible lateral inclination. A literature compilation on the subject entitled "Keyboard Designs and Operation: A Review of the Major Issues" by Alden et al was published in the August 1972 issue of The Journal of the Human Factors Society with comments on a selected few prior publications. An article by a K. H. E. Kroemer is referenced wherein a special keyboard is disclosed with a modified key arrangement and orientation as well as a keyboard having spaced lateral inclined portions on which the special key assemblies are mounted. The Alden article list some 80 different publications pertinent to the general subject of the keyboard devices.

U.S. Pat. No. 4,378,553 discloses a keyboard formed into two separate parts which can be appropriately spaced and located for use by physically handicapped operators requiring minimal movement during actual inputting of data to the device.

The extensive literature indicates the general interest and concern which has been created in the field. However, the keyboard with the standard orientation and key arrangement is universally used throughout the field of information processing. A significant need exists for a feasible keyboard construction which can retain the present key arrangement, and particularly adapted for retrofitting of existing devices.

SUMMARY OF THE PRESENT INVENTION

The present invention is particularly directed to a keyboard apparatus having the keyboard rearranged to facilitate the use of the keyboard without the usual positioning and movement of the hands relative to arms and in a manner which avoids wrist tensions and complications, and thereby minimizing, if not essentially eliminating, the problem of wrist injury.

Generally, in accordance with the teaching of the this invention, the keyboard is formed with a pair of planar portions or sections having individual universal support units whereby the keyboard sections are adapted to be inclined in space from an intermediate portion of the keyboard to present a more or less inverted V-shaped keyboard assembly tailored to the particular user or operator. The keyboard is preferably formed with the apex at the center, with half the keys arranged to one section and the second half of the keys arranged on the second section of the keyboard. The keys and interrelated mechanism can be constructed in essentially the same manner as presently constructed, although any variation can of course be provided if desired. With the standard key presentation, the operator will operate the dual inclined keyboard essentially in the identical manner they now input the standard keyboard. However, the universal mount or support unit allows the positioning of the keyboard sections for optimal operator comfort and physical safety. The physical difference to the operator however is dramatic in that the hand project straight out from the arm without the necessity of significant angulation or twist, and particular change therein between the hand and the arm at the wrist portion.

In the preferred construction of the support unit, the post structure is extendible as by a telescopic construction. In addition, each base is releasably mounted to a support member permitting lateral spacing of the sections. Thus, each section can be oriented in space with optimal setting of the keyboard for different operators.