PALM-SIZED COMPUTER WITH A FRAME TO HOLD DEVICE PLATES

CLAIM OF PRIORITY

This application makes reference to, incorporates the same herein, and claims all benefits accruing under 35 U.S.C. §119 from an application for PALM-SIZED COMPUTER WITH A FRAME TO HOLD DEVICE PLATES earlier filed in the Korean Industrial Property Office on Apr. 3, 1998 and there duly assigned Serial No. 11897/1998.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to electrical systems and devices, particularly a palm-sized computer, and more particularly a frame for holding device plates such as liquid crystal display panel, printed circuit board, etc. in the housing of a palm-sized computer.

2. Related Art

Personal computers are classified on the basis of size and portability. Personal computers that can be placed on top of a desk but are not very portable are called desktop computers. Portable computers are those personal computers that are light enough to be easily transported. Portable personal computers that are small enough to be set on the lap of a user are called laptop computers; notebook computers are approximately the size of a book. Portable personal computers that can be put in a pocket are called pocket or palm-sized computers. A notebook computer typically has a keyboard as its input unit, but a pocket or palm-sized computer usually employs a stylus as its input unit instead of a keyboard because the stylus enhances the portability and facilitates data input.

A conventional palm-sized computer **300** includes a top housing part, a bottom housing part, a frame, a liquid crystal display (LCD) panel, and a printed circuit board (PCB). The frame, LCD panel and PCB, hereinafter referred to as device plates, are mounted in the internal space between the assembled top and bottom housing parts. The device plates are fixedly attached to the bottom housing part by means of a plurality of screws, which are inserted through a plurality of corresponding holes formed in the device plates and fixed into a plurality of corresponding bosses formed on the bottom housing part. In addition, the top housing part has a battery case to receive a battery inserted through a battery door formed in the bottom housing part. The battery case includes electrical terminals connected with the electronic devices of the computer.

Such a conventional palm-sized computer suffers the drawback that the many screws required to fix the device plates cause a considerable increase in the size of the housing. That is, in order to fix the device plates by using the screws, there are required a plurality of corresponding bosses formed on the inside of the bottom housing part. This causes an overall size increase of the palm-sized computer. In addition, because the device plates are rigidly connected with the bottom housing by means many screws, an impact externally exerted to the housing is directly transmitted to the electronic devices, and thus may easily destroy them. Further, assembly of the conventional palm-sized computer is achieved through very complicated processing steps to assemble the device plates and battery terminals especially because the battery terminals are separately prepared to connect with the electronic devices by means of separate conductive lines. This increases the number of the steps of assembling the devices.

Additional examples of the structures of hand-held electronic devices are seen, for example, in the following U.S. patents. U.S. Pat. No. 5,373,458, to Bishay et al., entitled Enclosure For A Hand-Held Computer, describes a hand-held computer which has an accessory interface board connected to the housing by two screws. A printed circuit board is flexibly connected to the liquid crystal display. The printed circuit board is securely held between the top enclosure portion, that is, the housing, and the bottom enclosure portion. The liquid crystal display is allowed to "float" to prevent it from shock. An alternative embodiment which allows the printed circuit board to "float" is mentioned but not shown or described. As shown, the printed circuit board directly rests against the housing, and moreover this design requires a robust flexible connection between the PCB and the LCD.

U.S. Pat. No. 5,515,303, to Cargin Jr. et al., entitled Hand-Held Computerized Data Collection Terminal With Rechargeable Battery Pack Sensor And Battery Power Conservation, describes a device in which a circuit board is connected to the display though connector elements through a conductive pad. The circuit board and the display are screwed to the housing, and thus have the problem of shock transmission through the housing. The battery case is formed in the housing and the electrical connection to the printed circuit board is through a battery supply connector with a plurality of receptors mating with the host board to provide battery power to the terminal.

U.S. Pat. No. 5,617,343, to Danielson et al., entitled Portable Work Station And Data Collection Terminal Including Switchable Multi Purpose Touch Screen Display, describes a handheld data terminal. The device has a circuit board attached to the housing by several screws, which can lead to the problem of impact transmission to the circuit board.

Also of note is U.S. Pat. No. 5,863,674, to Yamanaka, entitled Battery Terminals For a Miniature Electronic Apparatus And Structure For Holding The Same. This patent describes an arrangement of battery terminals which mount directly to a circuit board, and which engage grooves in the battery casing to give the battery casing arrangement.

As noted above, the palm-sized computers of the conventional art generally require numerous screws and bosses in the housing, have a rigid direct connection between the device plates and the housing, and require separate wiring from the battery to the printed circuit board.

SUMMARY OF THE INVENTION

It is therefore an object of the invention to provide an improved palm-sized computer.

It is a further object of the invention to provide a palm-sized computer of smaller size.

It is a yet further object of the invention to provide a palm-sized computer with a reduced housing size.

It is a still further object of the invention to provide a palm-sized computer with improved impact-resistance of the device plates.

It is a still yet further object of the invention to provide a palm-sized computer which can be assembled in fewer and less complicated steps.

It is another object of the invention to provide a palm-sized computer in which the process of mounting the device plates in the housing is simplified.

According to an embodiment of the present invention, a palm-sized computer comprises a housing for encasing the