159159

A COMPUTER PERIPHERAL DEVICE ADAPTER

BACKGROUND AND FIELD OF INVENTION

This invention relates to a computer peripheral device adapter, more particularly but not exclusively, to an ExpressCard/34 to 54mm card slot adapter.

With the advent of the PC Card (or more appropriately PCMCIA Card) Standard, it is possible to enhance the functions of a personal computer and in particular a notebook computer. PC Card devices come in three different types, Type I, II and III, but all are adapted to connect to a 68 pin connector.

The PC Card Standard is slowly being replaced by ExpressCard™ Technology due to its bigger bandwidth. ExpressCard™ supports two form factors – ExpressCard/34 (34mm wide) and ExpressCard/54 (54mm wide). Both form factors have the same connector width (i.e. 34mm) and pin connectors (26 pins) which means that ExpressCard/34 can fit into both 34mm and 54mm card slots. However, since an ExpressCard/34 device is 34mm wide, the device may not connect securely in a 54mm card slot. Moreover, with more and more applications using ExpressCards technology, when for example, the ExpressCard is a broadband modem or a sound module, the size of the section which is exposed when the ExpressCard is placed into the card slot for operative connection of the ExpressCard is usually larger and thicker which creates stability problems when an ExpressCard/34 device is inserted into a

G00002

54mm card slot. In addition, the large section which is exposed typically also encounters a high incidence of accidental contact which further exacerbates the aforementioned stability problems.

It is thus an object of this invention to provide a computer peripheral device adapter which addresses at least one of the disadvantages of the prior art and/or to provide the public with a useful choice.

SUMMARY OF THE INVENTION

In a first aspect, a computer peripheral device adapter comprising
an attachment member with an attachment mechanism for attaching the adaptor to a first portion of a computer peripheral card device; and
an extension member connected to the attachment member, the extension member being insertable into a card slot together with a part of the computer peripheral card device and configured to reduce movement of the computer peripheral card device in the card slot and still allowing the computer peripheral card device to connect directly to a connector of the card slot, wherein the computer peripheral device adapter is configured to attach to the first portion of the computer peripheral card device external of the card slot.

When the computer peripheral device adapter is attached to an ExpressCard/34 card device, for example, and the ExpressCard/34 card device used in a 54mm card slot, the extension member is configured to extend the width of the

ExpressCard/34 card device to match the 54mm card slot. Thus, the extension member is able to reduce movement of the ExpressCard/34 card device to prevent the ExpressCard/34 from being dislodged or disconnected from the connector of the card slot when the free end of the ExpressCard/34 is knocked.

The attachment mechanism may be selected from a group comprising: a pair of side arms for releasably attaching to the computer peripheral card device in a snap fit arrangement, adhesive strips, Velcro strips, and magnetic strips. If the attachment mechanism is a pair of side arms, the arms possess an extent of flexibility.

Preferably, the computer peripheral device adapter comprises a planar support wall connected to the pair of side arms, the support wall being adapted to contact the first portion of the computer peripheral card device. A length of the support wall may be variable such that a distance between the pair of side arms is also variable.

Preferably, the support wall in contact with the first portion of the computer peripheral device is coated with a layer of material having high coefficient of friction. This reduces movement of the first portion of the computer peripheral device.

Preferably, the arrangement of the attachment member and the extension member is substantially L-shape.

Also, it is preferred that an edge of the extension member is arranged to be aligned with an edge of the computer peripheral card device.

The width of the extension member may be about 20mm.

The adapter of the present invention may be used as a 34mm to 54mm ExpressCard™ adapter.

Preferably, the attachment member is configured to allows part of the first portion of the computer peripheral card device to be exposed to allow access to the first portion of the computer peripheral card device.

The computer peripheral device adapter may be made and sold as an individual item or it can be sold in combination with a computer peripheral card device, such as an Expresscard/34 peripheral device. When used together with the Expresscard/34 peripheral device, the peripheral device is arranged to be inserted together with the extension member into a 54mm card slot of a computer.

For example, the computer peripheral card device may be a Sound Blaster™ X-Fi Notebook ExpressCard/34. The computer peripheral card device may include connectors.

BRIEF DESCRIPTION OF THE DRAWINGS

An embodiment of the invention will now be described, by way of example, with reference to the accompanying drawings in which,

Figure 1 is a perspective view of a computer peripheral device adapter according to a preferred embodiment of the present invention;

Figure 2 is an underside view of the computer peripheral device adapter of Figure 1;

Figure 3 shows the computer peripheral device adapter of Figure 1 attached to a computer peripheral card device;

Figure 4 is an underside view of the arrangement of Figure 3;

Figures 5A to 5C shows how a computer peripheral card device (smaller scale) is attached to and removed from the computer peripheral device adapter (smaller scale) of Figure 1;

Figure 6 is a simplified cross sectional view (different scale) showing how the arrangement of Figure 3 is inserted into an ExpressCard/54 (54mm wide) card slot; and

Figure 7 is a view of an alternative embodiment of a support wall of the computer peripheral device adapter of Figure 1.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Figure 1 is a perspective view of a computer peripheral device adapter 100 according to a preferred embodiment of the present invention, and Figure 2 shows an underside view.

The computer peripheral device adapter 100 is injection moulded as a unitary structure and formed from plastics material. The plastics material may be in a form of a thermoplastic such as, for example, Acrylonitrile Butadiene Styrene (ABS), Polycarbonate (PC) and so forth. The plastics material which is used preferably has properties such as, for example, stiffness to maintain a structure of the computer peripheral device adaptor 100, heat resistance to prevent warping of the structure of the computer peripheral device adaptor 100, impact resistance to prevent breakage of the computer peripheral device adaptor 100, flexibility to enable a degree of material pliability for the computer peripheral device adaptor 100 and so forth. Subsequent portions of the description will show how the aforementioned properties of the plastics material are desirable for the computer peripheral device adaptor 100.

The computer peripheral device adapter 100 comprises an attachment member 102 and an extension member 104 connected to the attachment member 102. The attachment member 102 includes a support wall 106 which is substantially planar and rectangular in shape, and side arms 108,110 project outwards from its two ends. Two guide portions 112,114 also extend from each side of one of the side arms 110 along the perimeter of the support wall 106. The side arms 108,110 (and the support wall 106) are adapted to releasably attach to a

computer peripheral card device such as the one illustrated in Figures 3 and 4 which is an ExpressCard/34 Sound Blaster X-Fi Notebook 200 manufactured by Creative Technology Ltd. The attachment of the computer peripheral device adaptor 100 to the ExpressCard/34 Sound Blaster X-Fi Notebook 200 is in a "snap-fit" manner. The ExpressCard/34 Blaster X-Fi Notebook 200 comprises an ExpressCard/34 module 202 which has a standard 34mm form factor and an connector module 204 which has a larger/thicker body and includes earphone and/or microphone sockets 205 as shown in Figure 3. It should be noted that a number and form of connectors on the connector module 204 as shown in Figure 3 is not limiting in any manner. In addition, it should be noted that a honeycomb structure 105 as shown in Figures 2 and 4 for the extension member 104 is partially for structural rigidity of the extension member 104 and for aesthetic purposes.

The side arms 108,110 have a slight curvature to match the body of the connector module 204 and together with the guide portions 112,114 serve to securely hold the connector module 204 (and thus, the entire ExpressCard/34 Blaster X-Fi Notebook 200) as shown in Figures 3 and 4. At least one of the side arms 108,110 should have some degree of flexibility to allow the computer peripheral device adaptor 100 to be attached to the connector module 204 of the ExpressCard/34 Blaster X-Fi Notebook 200 in a "snap-fit" manner.

It should be appreciated that the support wall 106 may be a strip rather than a wall which contacts the connector module 204 such that the connector module

204 rests against the support wall 106. Besides contacting the connector module 204, the support wall 106 may be for maintaining a distance of the side arms 108,110.

A length of the support wall 106 may also be varied to enable variation in a distance of the side arms 108,110 although this is not shown in the figures. Referring to Figure 7, there is shown an alternative representation of the support wall 106. It can be appreciated that, in this alternative representation, the support wall 106 is divided into two parts 106a,106b. The length of the support wall 106 is varied using a teeth-and-stopper mechanism 107 as shown in Figure 7. When the distance of the side arms 108,110, is variable, the computer peripheral device adaptor 100 is attachable to the ExpressCard/34 Blaster X-Fi Notebook 200 regardless of connector module 204 size (for example, if future generations of the ExpressCard/34 Blaster X-Fi Notebook 200 have larger connector modules 204).

The extension member 104 extends out near an end of the attachment member 102 to form a generally L-shape arrangement. The extension member 104 has a substantially planar and rectangular body 116. The thickness of the body 116 is configured to be 5mm or less so that the thickness of the extension member 104 is the same as or less than the form factor of the ExpressCard/34 module 202. A longitudinal edge 118 of the extension member 104 is aligned with an edge 202a of the ExpressCard/34 module 202 so that the longitudinal axis of the extension member 104 is substantially parallel with the longitudinal axis of

the ExpressCard/34 module 202. The longitudinal edge 118 of the extension member 104 may be either in contact with or not in contact with the edge 202a of the ExpressCard/34 module 202. This arrangement is shown in Figures 3 and 4 and when in place, the total width W of the ExpressCard/34 module and the extension member 104 is about 54mm which enables the ExpressCard/34 module and the extension member 104 to be inserted together into an ExpressCard/54 card slot with a width of 54mm. In this regard, it can be seen that the width of the extension member 104 is about 20mm.

As it can be appreciated from Figures 3 and 4, the length of the extension member 104 is adapted to be shorter than the length of the ExpressCard/34 module and this will be apparent later.

To use the computer peripheral device adapter 100 with the ExpressCard/34 Blaster X-Fi Notebook 200, it is necessary to first attach the ExpressCard/34 Blaster X-Fi Notebook 200 to the computer peripheral device adapter 100 and this is shown in Figures 5A and 5B. An end of the connector module 204 is first slid into the attachment member 102 so that the end engages with one of the side arms 110 and the two guide portions 112,114, as shown by arrow A in Figure 5A. Next, a slight pressure is applied using the thumb, for example, on the body of the connector module 204, as shown by arrow B, to snap the connector module 204 into place and with the extension member 104 aligned side by side with the ExpressCard/34 module 202 of the ExpressCard/34 Blaster X-Fi Notebook 200. It should be apparent that part of the connector

module 204 is exposed or not covered by the attachment member 102. It is advantageous that the attachment member 102 allows part of the connector module 204 to be exposed as this allows access to the earphone and/or microphone sockets 205 even when the computer peripheral device adaptor 100 is attached to the ExpressCard/34 Blaster X-Fi Notebook 200.

Figure 6 illustrates a simplified cross-sectional view of how the ExpressCard/34 Blaster X-Fi Notebook 200 is plugged into a connector 300 of a ExpressCard/54 card slot 400 (with a width of 54mm) of a notebook computer (not shown in its entirety). As it can be appreciated, extension member 104 is shorter than the ExpressCard/34 module 202 due to the presence of a guide 402 usually present in the ExpressCard/54 card slot 400. It is evident that the arrangement of the shorter extension member 104 still allows the ExpressCard/34 Blaster X-Fi Notebook 200 to be directly connected to or plugged into the connector 300 of the ExpressCard/54 card slot 400 even when the computer peripheral device adaptor 100 is attached to the ExpressCard/34 Blaster X-Fi Notebook 200. It should be appreciated that the computer peripheral device adapter 100 is configured to attach to the connector module 204 outside of the card slot 400.

Since the extension member 104 is configured to substantially fill up a void 403 in the ExpressCard/54 slot 400, this provides a more secure connection for the ExpressCard/34 module 202 with the connector 300. For example, when accidental force is applied to the connector module 204 (which protrudes from the ExpressCard/54 slot 400), the presence of the extension member 104

occupying the void 403 in the slot 400 reduces or prevents any movement that would disconnect or dislodge the ExpressCard/34 module 202 from the connector 300. Thus, a more stable and secured connection is achieved. In addition, access to the earphone and/or microphone sockets 205 on the connector module 204 is also not hampered in any form or manner. This clearly demonstrates that the attachment of the computer peripheral device adaptor 100 to the ExpressCard/34 Blaster X-Fi Notebook 200 does not hamper functionality of the ExpressCard/34 Blaster X-Fi Notebook 200. Furthermore, it should be appreciated that the computer peripheral device adapter 100 enables the extension member 104 to be located appropriately at the void 403 of the ExpressCard/54 card slot 400. This is so even in an instance when the connector module 204 blocks an entrance of the ExpressCard/54 card slot 400 and correspondingly blocks insertion of any object into the ExpressCard/54 card slot 400.

To remove the ExpressCard/34 Blaster X-Fi Notebook 200 from the computer peripheral device adapter 100, each component is held in each hand as shown in Figure 5C and with a twisting and lifting motion (concurrent twisting of the computer peripheral device adapter 100 and lifting of the ExpressCard/34 Blaster X-Fi Notebook 200) which results in flexure of the side arm 110 of the computer peripheral device adapter 100, as shown by arrows C, the ExpressCard/34 Blaster X-Fi Notebook 200 is detached from the computer peripheral device adapter 100. Alternatively, forcibly flexing the side arm 110 of the computer peripheral device adapter 100 and subsequently removing the

ExpressCard/34 Blaster X-Fi Notebook 200 from the computer peripheral device adapter 100 using either one or two hands may also be employed to detach the ExpressCard/34 Blaster X-Fi Notebook 200 from the computer peripheral device adapter 100. This alternative is not depicted in the figures but it should be apparent from the provided figures as the method does not differ significantly from the earlier method described using Figure 5C.

The described embodiments should not be construed as limitative. For example, in the described embodiment, the computer peripheral device adapter 100 is configured to be attached to the ExpressCard/34 Sound Blaster™ X-Fi Notebook 200 but the adapter 100 may be adapted to be attached to other types of ExpressCard. Of course, with new card technology being introduced, the computer peripheral device adapter may similarly be adapted to other card technologies, and not just for ExpressCard. This may mean that the attachment member 102 and the extension member 104 take other forms, configurations and dimensions and thus, the structure of the attachment member 102 and the extension member 104 is certainly not limited to what is described.

The described embodiment uses a "snap fit" mechanism to attach the adapter 100 to the Notebook 200 but other ways of attachment may be used. Some other ways of attachment may include the use of, for example, adhesive strips, Velcro strips, magnetic strips, and so forth. The guide portions 112,114 may be removed and this may allow the position of the ExpressCard to be adjusted relative to the adapter 100 and thus, allowing the adapter 100 to be attached to

different types of ExpressCard (i.e. with different dimensions, shapes, sizes, form factors and so forth). Coating a surface of the support wall 106 (either partially or completely) in contact with the connector module 204 with a layer of material with high coefficient of friction may also cause the guide portions 112, 114 to be removed as the layer of material aids in preventing movement of the connector module 204.

With reference to Figures 3 and 4, it should be evident that the first guide portion 112 of the computer peripheral device adaptor 100 prevents the ExpressCard/34 Blaster X-Fi Notebook 200 from sliding out from the attached computer peripheral device adaptor 100 in a first direction 207. However, the second guide portion 114 of the computer peripheral device adaptor 100 does not prevent the ExpressCard/34 Blaster X-Fi Notebook 200 from sliding out from the attached computer peripheral device adaptor 100 in a second direction 209 because of presence of the extension member 104. The extension member 104 would act as a stopper which blocks the connector module 204 and prevents the ExpressCard/34 Blaster X-Fi Notebook 200 from sliding out from the attached computer peripheral device adaptor 100 in the second direction 209. As such, it can be seen that the second guide portion 114 may be omitted without detriment to the attachment of the computer peripheral device adaptor 100 to the ExpressCard/34 Blaster X-Fi Notebook 200.

Having now fully described the invention, it should be apparent to one of ordinary skill in the art that many modifications can be made hereto without departing from the scope as claimed.

CLAIMS

1. A computer peripheral device adapter comprising

an attachment member with an attachment mechanism for attaching the adaptor to a first portion of a computer peripheral card device; and

an extension member connected to the attachment member, the extension member being insertable into a card slot together with a part of the computer peripheral card device and configured to reduce movement of the computer peripheral card device in the card slot and still allowing the computer peripheral card device to connect directly to a connector of the card slot,

wherein the computer peripheral device adapter is configured to attach to the first portion of the computer peripheral card device external of the card slot.

2. A computer peripheral device adapter according to claim 1, wherein the attachment mechanism is selected from a group comprising: a pair of side arms for releasably attaching to the computer peripheral card device in a snap fit arrangement, adhesive strips, Velcro strips, and magnetic strips.

3. A computer peripheral device according to claim 2, wherein the pair of side arms possess an extent of flexibility.

4. A computer peripheral device according to claim 2, further comprising a planar support wall connected to the pair of side arms, the support wall being adapted to contact the first portion of the computer peripheral card device.

5. A computer peripheral device according to claim 4, wherein a length of the support wall is variable such that a distance between the pair of side arms is also variable.

6. A computer peripheral device according to claim 4, wherein the support wall in contact with the first portion of the computer peripheral device is coated with a layer of material having high coefficient of friction.

7. A computer peripheral device adapter according to any preceding claim, wherein the arrangement of the attachment member and the extension member is substantially L-shape.

8. A computer peripheral device adapter according to any preceding claim wherein an edge of the extension member is arranged to be aligned with an edge of the computer peripheral card device.

9. A computer peripheral device adapter according to any preceding claim, wherein the width of the extension member is about 20mm.

10. A computer peripheral device adapter according to any preceding claim, wherein the adapter is a 34mm to 54mm ExpressCard™ adapter.

11. A computer peripheral device adaptor according to any preceding claim, wherein the attachment member is configured to allow part of the first portion of the computer peripheral card device to be exposed to allow access to the first portion of the computer peripheral card device.

12. A computer peripheral device adaptor according to any preceding claim, wherein the extension member is configured to be located in a void of the card slot even when the first portion of the computer peripheral card device blocks an entrance of the card slot.

13. In combination, a computer peripheral device adapter of any preceding claim and a computer peripheral card device.

14. The combination of claim 13, wherein the computer peripheral card device is an Expresscard/34 peripheral device, the peripheral device being arranged to be inserted together with the extension member into a 54mm card slot of a computer.

15. The combination of claim 13 or 14, wherein the computer peripheral card device is a Sound Blaster™ X-Fi Notebook ExpressCard/34.

16. The combination according to any of claims 13 to 15, wherein the computer peripheral device adapter is a 34mm to 54mm Expresscard adapter.

17. The combination according to any of claims 13 to 16, wherein the computer peripheral card device includes connectors.