FLEXIBLE I/O PORT CONFIGURATION AND CONNECTOR LABELING SCHEME FOR COMPUTER CHASSIS

TECHNICAL FIELD

In one embodiment, the invention relates generally to computer chassis and, more particularly, to a flexible I/O port configuration and connector labeling scheme for a computer chassis.

BACKGROUND

Even using the most advanced CAD tools and production techniques, the process of designing, tooling and producing a computer chassis is one that takes several months to complete. In order to compete in today's market and introduce new products to the market as quickly as possible, it is necessary to design chassis that are capable of housing many different computer configurations without requiring expensive and time-consuming tooling changes to the chassis for each different configuration.

One of the greatest challenges in achieving this goal is that different system motherboards have different connectors that need to be accessed from outside the chassis. For example, one motherboard might have universal serial bus ("USB") and speaker connectors, while another might have a network connection and an extra serial port. Providing the appropriate connector cutouts in the chassis for each different motherboard quickly becomes unmanageable, as a tooling change is required for every motherboard that is used and a product-specific back panel or chassis base is required for every different product. Handling multiple chassis is expensive, as it requires the storage and management of many different part numbers. In addition, the flexibility of a manufacturing line is compromised, especially in build-to-order models where many different products are built on one line.

Historically, there have been numerous attempts to accommodate different I/O connector configurations with a single or a few different chassis. For example, a different chassis base can be created that has cutouts specific to each system board. This is expensive, in terms of tooling, administrative, and storage costs. It also creates manufacturing difficulties, as having a chassis for each board would mean having to store a variety of different bases on-line for assemblers to pull from.

Another way to solve the problem is to change the cutouts in the chassis base each time a new product is introduced; however, this solution only works if a manufacture does a hard switch-over from one product to another, because once the manufacturer completes the switch-over, it could not switch back without retooling the chassis base. This solution is also deficient in that it would require the manufacturer to store and manage many different revisions of parts for repairs and service stock.

Another area of concern in connection with computer chassis is the need to label the different connectors accessible through the rear wall of the chassis. Such labeling has in the past been accomplished by simply stamping icons identifying the connectors directly onto the rear wall of the chassis itself. This method has become less popular, however, as ever-stricter environmental requirements, especially in Europe, render it inadvisable to stamp icons directly onto the chassis, as the ink contaminates the part of the chassis to which it is applied, making it more difficult to recycle.

Another solution has been to stamp the icons onto a labeling strip, which is then affixed to the computer chassis with an adhesive. This solution is also deficient in certain respects. In particular, it is often difficult to properly align a strip as it is being applied to the chassis. Moreover, although it is possible, albeit fairly difficult, to remove and realign the strip, removal of the strip leaves a messy adhesive residue that must be cleaned before the same or another strip can be applied.

Accordingly, what is needed is a flexible I/O port configuration for computer chassis which has a labeling mechanism that is environmentally acceptable and easy to align properly.

SUMMARY

One embodiment includes an I/O shield that is attached to a system motherboard. The I/O shield includes connector cutouts specific to the system motherboard. In this manner, the motherboard to which the I/O shield is attached may be installed in a generic chassis that includes cutouts for "standard" connectors, such as VGA, keyboard, audio and mouse connectors, as well as a flexible I/O cutout for receiving custom connectors, such as USB and network connectors. Any connector cutout or portion of a cutout provided in the chassis through which a connector does not extend is filled by the I/O shield.

In another aspect of the above-described embodiment, an I/O labeling strip on which are printed icons for identifying the various connectors is press-fit onto the chassis, rather than being affixed thereto with adhesive, such that the strip can be easily removed and replaced. Moreover, each strip is provided with an alignment code that corresponds to an alignment code stamped on the I/O shield and visible through an unused or partially used cutout of the chassis such that, when the proper strip is applied to the chassis, the codes are also aligned with one another.

A technical advantage achieved is that a single chassis design can be used to house several different computer systems, thereby reducing the number of parts that must be kept in inventory.

Another technical advantage achieved is that the I/O shield can be connected to the motherboard by the motherboard manufacturer, thereby reducing the amount of labor that must be expended by the computer manufacturer.

A further technical advantage achieved is that I/O labeling strips can be easily removed and replaced when necessary.

Yet another technical advantage achieved with the invention is that use of the I/O labeling strip prevents any part of the chassis from being contaminated by the ink used to label the connectors.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a partial cutaway view of the rear of a computer chassis according to one embodiment of the present invention.

FIG. **2** is a perspective view of a computer system motherboard according to one embodiment of the present invention.

FIG. **3** is a partial cutaway view of the computer system motherboard of FIG. **2** being installed in the computer chassis of FIG. **1**.

FIG. **4** is a rear plan view of the computer chassis of FIG. **1** after the computer system motherboard of FIG. **2** has been installed therein.

FIGS. **5** and **6** illustrate installation of an I/O label strip according to one embodiment of the present invention.