Description

This invention relates generally to a shielded, plugable, mounting enclosure for printed circuit cards such as used in a computer.

The invention described in this application is related to the invention described in copending application EP-A-0 317 467.

Improvements in semiconductor technology have contributed to a manyfold increase in the number of electronic devices used in everyday life. The reduced size and cost of transistors and integrated circuits have made many electronic devices virtual necessities to every day life. The expansion of electronic devices has occurred in the work place as well as the home, bringing people with virtually no electronic experience or skills into contact as purchasers and users.

There are two seemingly unrelated problems resulting from this expansion of electronics. First, there is an ever increasing problem of electromagnetic interference caused by such devices. Virtually every electronic device, intentionally or not, emits some form of electromagnetic radiation. While this condition could be tolerated when few devices existed, the increasing number of electronic devices has made the problem more acute. The problem has been exacerbated by the "improvement" in semiconductor devices which allows them to operate at higher speeds, generally causing emission in the higher frequency bands where interference is more likely to occur. Successful minimization of the interference problem, sometimes referred to as "electro-magnetic compatibility" or "EMC", generally requires that emissions from a given device be reduced by shielding and other means, and shielding be employed to reduce the sensitivity of device to fields from other devices. Since shielding helps to reduce sensitivity to external fields as well as reduce emissions from the device, it is a common approach to a solution of the problem.

Another problem which has arisen with the reduced cost and size of customer/user to perform tasks which were formerly performed by highly skilled maintenance and service personnel. Today, when a computer is purchased it is not uncommon for the purchaser to literally carry it out of the store. This means that the set-up and installation of features must be done by the customer, who seldom has any specialized electronic skills. This situation mandates that the set-up and installation of features be very simple and virtually foolproof.

Looking now at the problems as they co-exist, it would be unrealistic to expect an unskilled user to be able to cope with the complex interlocking shielding or even fingerstock commonly used to achieve an adequate level of shielding. The prior art shielded enclosures have been designed for use by skilled technicians and often require the use of tools during installation and removal. Even further, even the plugging of circuit cards which contain upwards of twenty contacts is something not reliably accomplished by the unskilled user.

An additional problem is created when cables or supplementary or "add on" cards are to be connected to a system. Such devices commonly must be accurately plugged to avoid damage or improper operation of the system. The inadvertent unplugging of a cable while the system is in operation may create errors which completely disable the system.

DE-A-3 604 860 describes an arrangement for electromagnetically shielding a plurality of pluggable electric elements, each of which comprises a grounding spring for engaging the inner surface of the invention.

EP-A-188 968 describes a write/read device comprising several pluggable electronic memory modules comprising a locking mechanism.

Nevertheless, none of these documents describes the pluggable assembly described herein.

The principle object of the invention is to provide a shielded interposer assembly as defined in claim 1.

This invention provides a package for large and small printed circuit cards, easily handled and plugged by the unskilled user, which provides a very high degree of electromagnetic shielding and can serve as an interposer to accommodate the connection of cables as well.

The package includes a book-like housing, which can totally enclose and shield a circuit card, adapted to be plugged into a host assembly such as a computer backplane. The housing is easily adapted to polarization to prevent individual housings from being plugged into inappropriate slots in the backplane. The housing may include camming handles which serve to force the housing into the receiving socket, hold the housing in place after plugging, and serve to cam the housing out of the socket when the housing is to be removed. The housing includes a socket adapted for the connection of additional card enclosures or cables.

The housing has accommodation for the flow of cooling air over the enclosed circuit card to prevent overheating.

Fig. 1 is a partial isometric view of a portion of an assembly showing a plugable printed circuit card enclosure according to the invention.

Fig. 1a is a partial front view of the right rear corner of the system backplane showing the arrangement of the connector and grounding springs.

Fig. 1b is a sectional view of a grounding spring shown in Fig. 1a taken along the line 1b-1b.

Fig. 2 is an isometric view of a plugable printed circuit card enclosure according to the invention.

Fig. 3 is an isometric view of a plugable printed circuit card enclosure according to the invention wherein multiple cards may be serially plugged into the enclosure.

Fig. 4 is an isometric view of a plugable printed circuit card enclosure according to the invention wherein multiple cards may be adjacently plugged into the enclosure.

Fig. 5 is an isometric view of a plugable printed circuit card enclosure according to the invention wherein multiple cards may be plugged into the enclosure and held in position with a lever type latch which assists in the plugging and unplugging operation.

Fig. 6 is an isometric view of a plugable printed circuit card enclosure according to the invention wherein multiple cards may be plugged into the enclosure for the accommodation of plugable printed circuit card enclosures shown in Fig. 5.

Fig. 7 is an exploded view of a smaller pluggable printed circuit card enclosure showing the arrangement of the printed circuit card and identifying label.

With reference to Fig. 1, a computer backplane assembly comprises an enclosure 1 having a plurality of positions for card enclosures separated by guide rails 2. Cooling air holes 3 are located on the top surface 5 and the bottom surface 6. The rear of the enclosure 1 includes a plurality of connectors and grounding springs as shown in Fig. 1a.

With reference to Fig. 1a, which is a partial front view showing the right rear portion of the backplane enclosure 1, a connector is positioned to accept a complementary connector 21 on a plugable card assembly 20. A plurality of grounding springs 12 are positioned around the connector to provide shielding. The shape of grounding springs 12 is shown in Fig. 1b, which is a partial sectional view taken along the line 1b-1b of Fig. 1a. Each of the grounding springs 12 has a curved portion 13 which is deflected backwardly toward rear wall 14 by the rear surface of the plugable enclosure. The grounding springs 12 are fastened to the rear wall 14 by appropriate fasteners such as screws 15 which pass through the flat portion 16.

Plugable card assembly 20 is adapted to fit between the guide rails 2. If it is desired to restrict the plugable card assembly 20 to a single plug position, suitable keys can be provided on the enclosure 1 to prevent misplugging. For example, an enlarged corner key 25, which is adapted to fit a plugable card assembly having the upper left corner recessed to fit the corner key 25, can be provided to prevent plugging of assemblies which lack the correct key.

The plugable card assembly 20 includes a back, or first end, 30 on which the complementary connector 21 is mounted. The back end 30 is essentially flat to provide a good grounding surface for grounding springs 12. The top 31 of the enclosure contains a plurality of openings 32 having a maximum dimension of 2,54 cm (one inch) to accommodate the flow of cooling air. The bottom 35 contains a plurality of openings 36 to accommodate the flow of cooling air. Suitable means, such as a fan, may be used to force cooling air through the cooling air holes 3, the plugable card assembly 20 and out the openings 36. A grounding spring 37 is positioned on the top of plugable card assembly 20 for engaging the inner surface of the enclosure 1, and providing an improved connection to ground for shielding purposes.

A printed circuit card 84, having connections to complementary connector 21, is mounted within plugable card assembly 20. The embodiment shown in Fig. 1 is illustrative of an embodiment in which the circuit card occupies only a portion of the plugable card assembly 20. Alternatively, the circuit card can occupy the entire enclosure, in which case the open front portion 38 would be replaced with a solid face as will be later described.

A pair of handles 40 and 41 are pivotally mounted on bosses supported by projections 43 extending from the sides of plugable card assembly 20. These handles may be used to disengage the enclosure from the backplane by forcing handle 40 upwardly and handle 41 downwardly. The shorter portions 45 and 46 are thus brought to bear against the abutting front surface of the enclosure 1 and serve to cam the enclosure for disengagement with the enclosure 1.

A smaller, plugable "daughter" printed circuit card enclosure 60 is adapted to fit with the plugable card assembly 20 and make contact with the connector 61, mounted on partition 64 by means of a complementary connector, not shown, on the rear of the assembly. Enclosure 60 has holes 63 in the top surface 62, which coact with the openings 32 to provide a flow of cooling air over the electronic circuitry within the enclosure. The bottom surface of enclosure 60 also contains holes, not shown, for the passage of cooling air. A handle 65, pivoted at points 66 and 67, has a pair of ears 70 and 71 which coact with the slots 72 and 73 in the sides of plugable card assembly 20. The enclosure 60 is pushed inwardly until the ends of ears 70 and 71 come to bear against the back edge of slots 72 and 73. At this point the finger tab 74 is moved upwardly, causing the ears 70 and 71 to bear against the inner edges 80 and 81 of slots 72 and 73. Continued movement of finger tab 74 in the clockwise direction causes the pivot points 66 and 67 to cam against the inner edges 80 and 81 and force the connector of enclosure 60 into engagement with connector 61.

Fig. 2 shows an alternative form of enclosure for plugging into the enclosure 1. The printed circuit card enclosure 200 is proportioned to accommodate a larger card than the enclosure 60 previously described. Typical of such a larger card would be the card containing the processor circuitry or basis increment of memory for a small computer. The enclosure 200 contains no accommodation for the plugging of additional enclosures and therefore has a solid cover throughout. The enclosure 200 would be plugged into a slot similar to the slot which receives the plugable card assembly 20. In a fashion similar to plugable card assembly 20, the enclosure 200 has a grounding spring 237 on the top for coaction with the inner portion of the top of backplane assembly 1. Enclosure 200 also has handles 240 and 241 which serve the same purpose as the comparable elements of ugable card assembly 20. The shape of the holes 31 in the top 232 of enclosure 200 is somewhat different than the shape of the openings 32 in the plugable card assembly 20. The smaller, thinner holes may be desired when the circuitry contained within the enclosure is more sensitive to interference or has a greater tendency to emit radiation in an undesired spectrum.

Fig. 3 is illustrative of another embodiment of the plugable enclosure. It is desirable in some circumstances to provide a "piggyback" arrangement for optional printed circuit cards when those added later must rely on certain circuit features in earlier added cards, or where a plurality of cards share a common bus, such as memory cards. The basic enclosure 300, occupies the full depth of the enclosure 1. It has the same type of holes 332 in the top for air flow and the same type of handles 340 and 341 for extraction of the enclosure from ne backplane. The front of the enclosure 300 has an opening of sufficient width to accommodate the insertion of the smaller plugable assemblies 320 and 330, each of which may have a suitable connector 321 and a connector on the back of enclosure 320 which is not shown. A slot 350 in the side of enclosure 300 has a pair of holes 351 and 352 at the extremities. The holes are slightly larger than the corresponding buttons 371 and 381 on enclosures 320 and 330, respectively. Each of the buttons is mounted on a flexible tab portion of the side of the smaller enclosure. Tab portion 372 of enclosure 320 allows the button 371, and its counterpart on the opposite side of enclosure 320, to be deflected inwardly to allow the enclosure 320 to be inserted into the open end of the enclosure 300. The smaller enclosure is pushed into the larger until the connector, not shown, mates with the connector, not shown, on the inside of enclosure 300. At this point, button 371 lines up with slot 351 and pops out into slot 351 to retain the enclosure 320 in place. It will be appreciated that the button 371 will first pop out into the hole 352 and must be again deflected inwardly to allow completion of the insertion process.

The enclosure 330 may then be inserted into enclosure 300 in like fashion, locking into place when the button 381, on tab 382, pops out into hole 352.

Removal of the piggyback enclosures is accomplished by depressing the buttons, inwardly to disengage them from the holes and urging the enclosure outwardly.

The additional holes 353 and 354 are positioned to accommodate three piggyback enclosures having one third the length of those shown. Each one of the enclosures would then latch into one of the holes 352, 353, and 354.

A further alternative embodiment of plugable enclosure is shown in Fig. 4. In this embodiment, the top 431 of enclosure 400 has a plurality of air holes 432. Latches 440 and 441 provide the same function as previously described. A grounding spring 437 functions in the same manner as that for the earlier described embodiments.

The enclosure 400 is designed to accommodate the plugging of three smaller enclosures 470, 480 and 490. Each of these smaller enclosures has the same sort of locking buttons 471, 481 and 491 as that described with reference to the embodiment of Fig. 3. The locking buttons are mounted on flexible tongues 472, 482 and 492, respectively, to allow them to be deflected inwardly during the process of insertion into enclosure 400. It will be observed that the front of enclosure 400 has three cut-out portions 401, 402 and 403 to provide an area where the fingers can easily grasp the enclosure 470, 480 and 490 during the insertion and removal process. The holes 453, 452 and 454 coact with the buttons 471, 481 and 491 to lock the smaller enclosures in place.

If desired, one of the enclosures, for example enclosure 490, may have a socket 460 for the connection of a cable leading to a printer or other peripheral device.

To simplify the insertion process, guide rails 410 and 411 are located with the enclosure 400 to accurately position the individual smaller enclosures as they slid into place.

The embodiment of Fig. 5 shows a larger plugable enclosure 500 with one smaller enclosure 520 in position for insertion and one smaller enclosure 530 in the plugged position, illustrating the manner in which the handle 565 locks the enclosure in the plugged position.

The embodiment of Fig. 6 is similar to that of Figs. 4 and 5. The larger plugable enclosure 600 includes a provision for insertion of a variety of smaller plugable enclosures 620, 630, and 640,

each of which has a corresponding slot 621, 631, and 641 in the side walls of enclosure 600 for the locking handles 623, 633 and 643, respectively.

The connector 626 is plugged into socket 627 after insertion of the enclosure 620 into enclosure 600 and after handle 623 is locked in place as described with reference to Fig. 1. This locks enclosure 620 in place and it cannot be removed without first removing connector 626 from socket 627. This is desirable because of the adverse effect on system operation caused by the inadvertent disconnection of an I/O module such as contained in enclosure 620 during operation of a system. The error condition caused by such disconnection is one from which a typical computer system has a difficult time recovering, and it is therefore desirable to avoid.

Fig. 7 is an exploded view of a smaller plugable enclosure such as enclosure 520 shown in Fig. 5. This enclosure is suitable for holding a printed circuit card for the implantation of a feature which may be optional. That is, a standard minimum computer configuration might not require inclusion of the feature contained in this enclosure. The enclosure includes a left side 710, a right side 720, and a printed circuit card 730 mounted in the front 740. The circuit card 730 is spaced from side 710 by molding projections 711 and 712. A plurality of holes 731 connected to handles, not shown, on the circuit board 730 accommodate the lead wires to a connector mounted on the back of the enclosure. The handle 750 is pivotally mounted on bosses 751 extending from the ears 752. Holes for cooling air are provided by the opposing interlocking fingers 723 and 713 on sides 720 and 710, respectively. A label 760 may be affixed to the side 720 for identification purposes.

Claims

1. An interposer assembly (20), having a circuit card therein, for connection of an additional circuit card or cable to a system backplane, characterized in that it comprises:
   a. a metallic interposer housing having a top (31), a bottom (35), sides, a back (30) and a first connector (21) positioned on said back thereof for mating and connection with the system backplane;
   b. a second connector (61) affixed to a partition (64) positioned within said housing and connected to said circuit card (84) therein, said partition being a solid metallic member coacting with said sides and said back to constrain air flowing through said enclosure from said top to said bottom and providing electromagnetic shielding for the circuit card positioned within; and,
   c. a plurality of openings (32, 36) in the top and bottom of said housing for the flow of cooling air, said openings having a maximum dimension of 2,54 cm (one inch).

2. An interposer assembly according to claim 1 wherein said openings provide air flow over both sides of the card therein.

3. An interposer assembly according to claim 2 characterized in that it has at least one grounding spring (37) affixed to said housing for engagement with the support for said system backplane.

4. An interposer assembly according to any one of claims 1-3 characterized in that said back (30) has a flat region surrounding said connector for engagement with grounding springs (12) on the support for said system backplane.

5. An interposer assembly according to any one of claims 1-4 characterized in that it further includes:
   a. a pair of projections (43) extending forwardly from said assembly;
   b. a boss positioned to face inwardly on each of said projections; and,
   c. a handle (40, 41) pivotally mounted between each of said bosses.

6. A printed circuit card enclosure (60) for connection to a shielded interposer assembly as claimed in any one of claims 1-5, the assembly (20) having a connector (61) positioned therein, characterized in that it comprises:
   a. a metallic housing having a top (62), bottom, sides, back and a front;
   b. a further connector positioned on said back to mate with the connector within said interposer assembly;
   c. latch means (65, 70, 71, 74) positioned on said housing for engagement with said interposer assembly to retain said enclosure within said interposer assembly; and,
   d. a plurality of openings (63) in said top and bottom for coaction with corresponding openings (32, 36) in said interposer assembly for the flow of cooling air through said enclosure.

7. A printed circuit card enclosure according to claim 6, characterized in that it further includes:
   a. a cable socket connector (460; 627) positioned on said front for mating with an interconnecting cable.

each of which has a corresponding slot 621, 631, and 641 in the side walls of enclosure 600 for the locking handles 623, 633 and 643, respectively.

The connector 626 is plugged into socket 627 after insertion of the enclosure 620 into enclosure 600 and after handle 623 is locked in place as described with reference to Fig. 1. This locks enclosure 620 in place and it cannot be removed without first removing connector 626 from socket 627. This is desirable because of the adverse effect on system operation caused by the inadvertent disconnection of an I/O module such as contained in enclosure 620 during operation of a system. The error condition caused by such disconnection is one from which a typical computer system has a difficult time recovering, and it is therefore desirable to avoid.

Fig. 7 is an exploded view of a smaller plugable enclosure such as enclosure 520 shown in Fig. 5. This enclosure is suitable for holding a printed circuit card for the implantation of a feature which may be optional. That is, a standard minimum computer configuration might not require inclusion of the feature contained in this enclosure. The enclosure includes a left side 710, a right side 720, and a printed circuit card 730 mounted in the front 740. The circuit card 730 is spaced from side 710 by molding projections 711 and 712. A plurality of holes 731 connected to handles, not shown, on the circuit board 730 accommodate the lead wires to a connector mounted on the back of the enclosure. The handle 750 is pivotally mounted on bosses 751 extending from the ears 752. Holes for cooling air are provided by the opposing interlocking fingers 723 and 713 on sides 720 and 710, respectively. A label 760 may be affixed to the side 720 for identification purposes.

Claims

1. An interposer assembly (20), having a circuit card therein, for connection of an additional circuit card or cable to a system backplane, characterized in that it comprises:
   a. a metallic interposer housing having a top (31), a bottom (35), sides, a back (30) and a first connector (21) positioned on said back thereof for mating and connection with the system backplane;
   b. a second connector (61) affixed to a partition (64) positioned within said housing and connected to said circuit card (84) therein, said partition being a solid metallic member coacting with said sides and said back to constrain air flowing through said enclosure from said top to said bottom and providing electromagnetic shielding for the circuit card positioned within; and,
   c. a plurality of openings (32, 36) in the top and bottom of said housing for the flow of cooling air, said openings having a maximum dimension of 2,54 cm (one inch).

2. An interposer assembly according to claim 1 wherein said openings provide air flow over both sides of the card therein.

3. An interposer assembly according to claim 2 characterized in that it has at least one grounding spring (37) affixed to said housing for engagement with the support for said system backplane.

4. An interposer assembly according to any one of claims 1-3 characterized in that said back (30) has a flat region surrounding said connector for engagement with grounding springs (12) on the support for said system backplane.

5. An interposer assembly according to any one of claims 1-4 characterized in that it further includes:
   a. a pair of projections (43) extending forwardly from said assembly;
   b. a boss positioned to face inwardly on each of said projections; and,
   c. a handle (40, 41) pivotally mounted between each of said bosses.

6. A printed circuit card enclosure (60) for connection to a shielded interposer assembly as claimed in any one of claims 1-5, the assembly (20) having a connector (61) positioned therein, characterized in that it comprises:
   a. a metallic housing having a top (62), bottom, sides, back and a front;
   b. a further connector positioned on said back to mate with the connector within said interposer assembly;
   c. latch means (65, 70, 71, 74) positioned on said housing for engagement with said interposer assembly to retain said enclosure within said interposer assembly; and,
   d. a plurality of openings (63) in said top and bottom for coaction with corresponding openings (32, 36) in said interposer assembly for the flow of cooling air through said enclosure.

7. A printed circuit card enclosure according to claim 6, characterized in that it further includes:
   a. a cable socket connector (460; 627) positioned on said front for mating with an interconnecting cable.

8. A printed circuit card enclosure according to claim 7, characterized in that ::
said latch means is prevented from movement from a latched to an unlatched position when a cable is plugged into said cable socket connector.

Patentansprüche

1. Zwischengehäuseeinheit (20), die eine Schaltungskarte enthält, zur Verbindung einer zusätzlichen Schaltungskarte oder eines Kabels mit einer Systemrückwand, dadurch gekennzeichnet, daß sie folgendes aufweist:
a. ein metallisches Zwischengehäuse mit einem Oberteil (31), einem Boden (35), Seitenteilen, einem Rückenteil (30) und einem ersten Anschlußteil (21), der am Rückenteil dieses Gehäuses angebracht ist, um mit der Systemrückwand zusammenzupassen und für die Verbindung mit dieser;
b. ein zweites Anschlußteil (61), das an einer Trennwand (64) befestigt ist, die innerhalb des Gehäuses angeordnet und darin mit der Schaltungskarte (84) verbunden ist, wobei die Trennwand ein fester metallischer Teil ist, der mit den Seitenteilen und dem Rückenteil zusammenwirkt, um eine Luftströmung vom Oberteil durch das Gehäuse zum Boden zu erzwingen, und um für die elektromagnetische Abschirmung der darin liegenden Schaltungskarte zu sorgen, und
c. eine Mehrzahl von Öffnungen (32, 36) im Oberteil und im Boden des Gehäuses für die Strömung von Kühlluft, wobei diese Öffnungen eine maximale Größe von 2,54 cm (ein Inch) aufweisen.

2. Zwischengehäuseeinheit nach Anspruch 1, bei welcher diese Öffnungen eine Luftströmung zu beiden Seiten der darin liegenden Karte liefern.

3. Zwischengehäueeinheit nach Anspruch 2, dadurch gekennzeichnet, daß sie mindestens eine, an dem Gehäuse befestigste Erdungsfeder (37) aufweist, die in die Halterung für die Systemrückwand eingreift.

4. Zwischengehäuseeinheit nach Anspruch 1 bis 3, dadurch gekennzeichnet, daß der Rückenteil (30) einen ebenen Bereich aufweist, der das Anschlußteil zum Eingreifen der Erdungsfedern (12) in die Halterung für die Systemrückwand umgibt.

5. Zwischengehäuseeinheit nach Anspruch 1 bis 4, dadurch gekennzeichnet, daß sie ferner folgendes aufweist:
a. ein Paar von Vorsprüngen (43), die sich nach vorne aus der Einheit erstrecken;
b. eine nach Innen gerichtete Nocke an jeder Seite der Vorsprünge; und
c. eine Griff (40, 41) der zwischen jeder der Nocken schwenkbar angebracht ist.

6. Gehäuse (60) für gedruckte Schaltungskarten für den Anschlußteil an eine abgeschirmte Zwischengehäuseeinheit, nach einem der Ansprüche 1 bis 5, wobei die Einheit (20) ein ihr angeordnetes Anschlußteil (61) aufweist, dadurch gekennzeichnet, daß es folgendes aufweist:
a. ein metallisches Gehäuse, das einen Oberteil (62), einen Boden, Seitenteile, einen Rückenteil und einen Vorderteil besitzt;
b. ein weiteres Anschlußteil, das am Rückenteil angebracht ist, um mit dem Anschlußteil innerhalb der Zwischengehäuseeinheit zusammenzupassen; und
c. am Gehäuse angebrachte Einrastmittel (65, 70, 71, 74) für einen Eingriff in die Zwischengehäuseeinheit, um das Gehäuse innerhalb der Zwischengehäuseeinheit zu halten und
d. eine Mehrzahl von Öffnungen (63) in dem Oberteil und in dem Boden, um mit entsprechenden Öffnungen (32, 36) der Zwischengehäuseeinheit für die Strömung von Kühlluft durch das Gehäuse zusammenzuwirken.

7. Gehäuse (60) für gedruckte Schaltungskarten nach Anspruch 6, dadurch gekennzeichnet, daß es ferner folgendes aufweist:
a. einen am Vorderteil gelegenen Kabelbuchsenanschluß (460, 627), der mit einem Verbindungskabel zusammenpaßt.

8. Gehäuse (60) für gedruckte Schaltungskarten nach Anspruch 7, dadurch gekennzeichnet, daß
das Einrastmittel an einer Bewegung von einer eingerasteten zu einer nicht eingerasteten Position gehindert wird, wenn ein Kabel in der Kabelanschlußbuchse angesteckt ist.

Revendications

1. Dispositif interposeur (20), contenant une carte de circuit, pour connexion d'une carte de circuit supplémentaire ou d'un câble à un plan de fond de système, caractérisé en ce qu'il comprend :
(a) un boîtier métallique d'interposition, comportant une paroi supérieure (31), une paroi inférieure (35), des parois latérales, une paroi arrière (30) et un premier connec-

teur (21) placé sur sa dite paroi arrière pour accouplement et connexion avec le plan de fond du système ;
(b) un deuxième connecteur (61) fixé à une cloison (64), positionné à l'intérieur dudit boîtier et connecté à ladite carte de circuit (84) qui y est contenue, ladite cloison étant un élément métallique solide qui coopère avec lesdites parois latérales et ladite paroi arrière pour guider l'air qui circule dans ladite enceinte, de ladite paroi supérieure à ladite paroi inférieure, et pour assurer un blindage électromagnétique de ladite carte de circuit placée à l'intérieur de l'enceinte ; et
(c) une pluralité d'ouvertures (32,36) ménagées dans la paroi supérieure et la paroi inférieure du dit boîtier pour la circulation d'air de refroidissement, lesdites ouvertures ayant une dimension maximale de 2,54 cm.

2. Dispositif interposeur suivant la revendication 1, dans lequel lesdites ouvertures produisent une circulation d'air sur les deux faces de la carte placée dans le boîtier.

3. Dispositif interposeur suivant la revendication 2, caractérisé en ce qu'il comporte au moins un ressort de mise à la terre (32) fixé audit boîtier pour venir en prise avec le support dudit plan de fond de système.

4. Dispositif interposeur suivant l'une quelconque des revendications 1 à 3, caractérisé en ce que ladite paroi arrière (30) comporte une région plane entourant ledit connecteur, pour engagement avec des ressorts de mise à la terre (12) prévus sur le support du dit plan de fond de système.

5. Dispositif interposeur suivant l'une quelconque des revendications 1 à 4, caractérisé en ce qu'il comprend en outre :
(a) deux prolongements (43) s'étendant vers l'avant à partir dudit dispositif ;
(b) un bossage tourné vers l'intérieur, sur chacun desdits prolongements ; et
(c) une poignée (40,41) montée de façon pivotante entre chacun desdits bossages.

6. Cassette de carte de circuit imprimé (60) pour connexion à un dispositif interposeur blindé suivant l'une quelconque des revendications 1 à 5, le dispositif (20) comportant un connecteur (61) situé à l'intérieur, caractérisé en ce qu'elle comprend :
(a) un boîtier métallique comportant des parois supérieure (62), inférieure, latérales, arrière et avant ;
(b) un autre connecteur placé sur ladite paroi arrière, qui s'accouple avec le connecteur situé à l'intérieur dudit dispositif interposeur ;
(c) des moyens de verrouillage (65,70,71,74) placés sur ledit boîtier pour venir en prise avec ledit dispositif interposeur de manière à retenir ladite cassette dans ledit dispositif interposeur ; et
(d) une pluralité d'ouvertures (63) ménagées dans lesdites parois supérieure et inférieure pour coopérer avec des ouvertures correspondantes (32,36) prévues dans ledit dispositif interposeur afin de permettre la circulation d'air de refroidissement à travers ladite cassette.

7. Cassette de carte de circuit imprimé suivant la revendication 6, caractérisée en ce qu'elle comprend en outre :
(a) un connecteur de câble à emboîtement (460;627) placé sur ladite paroi avant, pour accouplement avec un câble d'interconnexion.

8. Cassette de carte de circuit imprimé suivant la revendication 7, caractérisée en ce que :
lesdits moyens de verrouillage sont empêchés de se déplacer d'une position verrouillée à une position déverrouillée, lorsqu'un câble est branché dans ledit connecteur de câble à emboîtement.

* C L M S *