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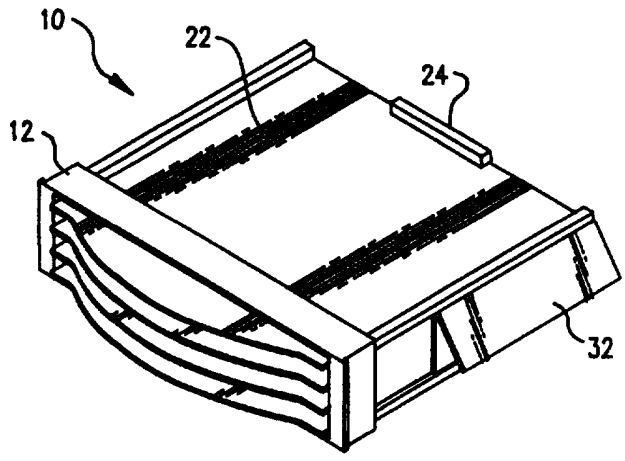
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(54) Title: STORAGE MODULE FOR USE WITH A PERSONAL COMPUTER



(57) Abstract

Disclosed is a storage module (10) for insertion into a recess of a computer housing, the recess having two oppositely disposed, parallel spaced-apart sidewalls and being designed for receiving a device for reading information from data storage media such as floppy disks or CD ROMs. The module includes a front panel (12) having an opening (14) for receiving items to be stored in the storage module (10). Two side panels (16, 18) extend generally orthogonal from the rear surface of the front panel (12), from opposite sides of the opening (14). A spring member (26 or 28) extends outwardly from at least one of the side panels (16 or 18), and asserts a force against at least one sidewall of the recess in the computer housing to secure the storage module (10) within the computer housing when the storage module is inserted into the recess. At least one support panel (20) extends between the side panels (16, 18), wherein each support panel is substantially perpendicular to both the side panels and the front panel (12).

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STORAGE MODULE FOR USE WITH A PERSONAL COMPUTER

Field of the Invention

The present invention generally relates to accessories for personal computers and, more specifically, relates to an accessory that provides storage space for computer disks and other accessories.

Background of the Invention

The advent of the personal computer and computer technologies has brought numerous computer tools and accessories to the work environment both at home and at the office. In this regard, while the computer may replace or complement a conventional typewriter, additional equipment and office supplies can customarily be found on or near a computer work station. Specifically, the computer workstation may include special desks, cabinets, storage media and other accessories to facilitate the use and operation of the personal computer.

Many accessories and instruments that are used in conjunction with a computer are susceptible to damage if mishandled or mistreated. For example, when data storage media such as a floppy disk is exposed to an electromagnetic field or a heat source, the stored data may be lost. In addition, data storage media often are susceptible to damage as a result of mishandling, e.g., bending or placing heavy objects on the media. Thus, it is advantageous to provide storage that protects the data storage media.

The risk of damage to data storage media often is relatively high because the computer or CPU (central processing unit) and the monitor often occupy a significant portion of the desktop or other available workspace. Hence, items including data storage media, papers, writing instruments and a variety of other tools and accessories often are placed on the CPU or monitor for temporary storage. Although desktop organizers and paper trays have a role in maintaining an efficient and organized workspace, a need exists for improved storage arrangements.

Although the desktop space may be limited, the CPU (central processing unit) is generally designed such that the CPU housing can accommodate a range of computing systems varying from

a basic computing system to a system that includes numerous peripheral accessory devices such as disk, CD ROM or tape drives, controller cards and memory cards. In this regard, currently available personal computers include several recesses or spaces of standard dimension for accepting components such as disk, CD ROM and tape drives. If these recesses are not used, they are generally covered by a removable face plate.

Some attempt has been made to adapt unused CPU recesses for storage of date storage media and/or other items. For example in U.S. Patent No. 4,712,843 to Castelli et al., a storage module or unit for a personal computer is disclosed in which the storage module is installed in a CPU recess. However, the storage module is not specifically adapted for containing data storage media, such as floppy disks or CD ROMs. Consequently, data storage media kept in the storage box of the Castelli et al. apparatus is not fully protected, and thus is still subject to being damaged. Further, the lack of special adaptation makes it difficult to organize data storage media within the module so that it is easily accessible when needed. Moreover, the storage module of Castelli et al. is somewhat difficult to install, requiring the use of screws.

Another example is U.S. Patent No. 5,080,452 to Tuckman, which also discloses a storage module or unit for a personal computer. Among the storage arrangements disclosed by Tuckman is a module having interior slots for receiving floppy disks. However, it is believed that such slots alone fail to provide adequate protection for data storage media. Further, the module disclosed by Tuckman is arranged for storing only one size and/or type of data storage media.

Accordingly, there is a need for a storage module or unit for use with a personal computer that provides adequate protection for data storage media contained therein, that is readily adaptable to more than one size and/or type of data storage media, and organizes data storage media contained therein, so that it is readily accessible.

Summary of the Invention

The present invention provides a storage module for use with a personal computer of the type that includes a housing or CPU box having unused space or recesses that are locked within

the housing (or CPU). More specifically, the present invention includes a storage module adapted to fit within a standard recess or slot of a computer housing.

The storage module of the present invention includes a front panel having an opening for receiving items to be stored in the storage module. Side panels extend orthogonally from the rear surface of the front panel from opposite sides of the opening. At least one of the side panels includes a spring member for asserting a force outward against at least one of the sidewalls of the recess of the computer housing, thereby securing the storage module within the computer housing when the storage module is inserted into the recess.

The storage module of the present invention further includes at least one support panel that is substantially perpendicular to both the side panels and the front panel. Additionally, in some embodiments, the storage module includes a plurality of the support panels, extending in a substantially parallel, spaced apart juxtaposition with one another between the side walls, the space between adjacent support panels being dimensioned to allow insertion of a data storage medium. The support panels separate the storage module into compartments that can be used to store floppy disks or other computer accessories when inserted into the CPU box. Preferably, the support panels are arranged to accept floppy disks of standard sizes, such as 5.25" or 3.5", or CD ROMs of a standard size.

A variety of embodiments are provided for the spring member of the storage module. One embodiment of the spring member includes a leg attached to one of the side panels, the leg being bent to project along the side panel at an acute angle so that it bears against at least one wall of the computer housing recess when the module is installed in the housing. Another embodiment of the spring member includes a leaf spring biased outwardly to bear against at least one wall of the computer housing recess. In yet another embodiment, the spring member includes a serpentine bias piece that initially extends away from an associated side panel, arcuately extends back toward the side panel, and then again extends arcuately away from the sidewall so that the outer end bears against a wall of the computer housing recess.

Brief Description of the Drawings

The foregoing aspects and many of the attendant advantages of this invention will become more readily appreciated as the same becomes better understood by reference to the following detailed description, when taken in conjunction with the accompanying drawings, wherein:

FIGURE 1A is a front exploded perspective view of a storage module constructed in accordance with the present invention;

FIGURE 1B is a front exploded perspective view of an alternative embodiment of a storage module constructed in accordance with the present invention;

FIGURE 2 is a front assembled view of the embodiment of FIGURE 1;

FIGURE 3 is a front perspective view of an additional alternative embodiment of a storage module constructed in accordance with the present invention;

FIGURE 4 is a cross-sectional view of the additional alternative embodiment of FIGURE 3, taken along section line 4-4 in FIGURE 3;

FIGURE 5 is a front perspective view of yet another alternative embodiment of a storage module constructed in accordance with the present invention;

FIGURE 6 is a front perspective view of part of still another alternative embodiment of a storage module constructed in accordance with the present invention; and

FIGURE 7 is a front perspective view of part of a further alternative embodiment of a storage module constructed in accordance with the present invention.

Detailed Description of the preferred Embodiment

Shown in FIGURE 1A is a first embodiment of a storage module 10 configured in accordance with the present invention. Storage module 10 includes a generally rectangular face plate 12. Centrally located in the face plate 12 is a rectangular opening 14. Extending perpendicularly from the oppositely disposed minor edges of the rectangular opening 14 are a pair of sidewalls 16 and 18. Mounted between the sidewalls 16 and 18 are a plurality of support plates 20, which are perpendicular to both the sidewalls 16 and 18 and to the face plate 12. The support

plates 20 are spaced apart from one another by a distance that allows data storage media, such as a floppy disk or a CD ROM to be received and stored between two adjacent support plates.

As can be seen in FIGURE 2, the forward edge of each support plate 20 is arcuately shaped and extends through the opening 14 to define a lip-like projection that extends forwardly from face plate 12. Centrally located along the rear edges of the spaced apart support plates 20 and extending upwardly is a stop plate 24, which prevents floppy disks, CD ROMs or other data storage media from passing beyond the rear face of storage module 10. It will be readily apparent to those skilled in the art that the support plates 20 may include ventilation holes (not shown). The ventilation holes 22 may permit circulation of air throughout the interior of the depicted embodiment to prevent heat build up around the storage media.

Referring back to FIGURE 1A, attached to the outwardly facing surface of each sidewall 16 and 18 are spring members 26 and 28, respectively. Each spring member 26 and 28 includes two legs 30 and 32 that extend angularly away from one another.

As previously noted, the storage module 10 of FIGURES 1A and 2 is dimensioned and arranged for installation in a recess of a computer housing that is designed for receiving devices such as tape drives, floppy disk drives, and CD ROM drives. When the storage module 10 is inserted into such an opening, the legs 32 of spring members 26 and 28 are deflected inwardly by the walls of the computer recess, thereby securely retaining the storage module 10 within the computer housing. Face plate 12 preferably is dimensioned so that the edge regions of the face plate come into abutment with portions of the computer housing that surround the recess into which the storage module 10 is installed.

Referring to FIGURE 1B, there is shown the storage module 10 of FIGURE 1A with alternative spring members 33 attached to each of the side walls 16 and 18. Each spring member 33 is elasticly deformed in a partial arc. When the storage module 10 is inserted into a computer recess, the spring members 33 are deformed inward thereby applying a continuous outward biasing force against the vertical walls of the computer recess; this force securely holds the storage module 10 within the recess. Each spring member 33 preferably includes outwardly protruding nubs 35. The nubs 35 engage apertures (not shown) in the respective vertical side walls of the recess.

Accordingly, the engagement of the nubs 35 with the apertures further acts to securely hold the storage module 10 within the recess. As noted above, the storage module 10 of FIGURE 1B is dimensioned for installation into the recess of the computer housing that is generally designed for receiving devices such as tape drives, floppy disk drives, and CD ROM drives. It is important to note with respect to the various storage modules 10 of the present invention, each of the storage module 10 can be inserted into a computer recess with the same force it would require to remove the storage module 10 from the recess. In this regard, installation and removal of the storage module can be readily and easily performed by an end user.

An alternative embodiment 34 of a storage module that is constructed in accordance with the present invention is shown in FIGURE 3. Alternative storage module 34 differs from the embodiment of FIGURES 1 and 2 in that it does not include a single plate 24 to limit the distance that data storage media can be inserted into the storage module. Instead, each support plate 20 includes an upwardly projecting tab 36. As can be seen in the cross-sectional view of FIGURE 4, the tabs 36 can be located at different distances from the forward edge of the support panels 20 to facilitate data storage media of various sizes, and/or to stagger the distance that data storage media of the same size can be inserted into the module 34, thus allowing a user to readily grasp an individual data storage medium.

Illustrated in FIGURE 5 is a second alternative embodiment of a storage module constructed in accordance with the present invention. Sidewalls 16 and 18 of storage module 37 include a plurality of rearwardly extending spaced part, substantially parallel grooves 40. Preferably, the grooves 40 receive support plates 20 of the type shown in FIGURES 1, 2 and 3. However, desired data storage media can be inserted into and received by the grooves. In the depicted arrangement, a single support plate 50 extends between and interconnects the lower regions of the sidewalls 16 and 18 to provide structural rigidity.

One advantageous feature of this arrangement of FIGURE 5 is that a support plate 20 need not be inserted into each groove 40. Thus, storage regions of different height can be established so that a single storage module can receive different sizes and/or types of data storage

media. For example, support plates 20 can be installed so that the storage module 37 can receive both floppy disks and CD ROMs.

The sidewalls 16 and 18 of storage module 37 each include longitudinally extending spring member 42 and 44 respectively, that differ from the spring members of the previously described embodiments. Specifically, spring members 42 and 44 each include a deflection arm 48 extending longitudinally along and angularly away form the storage module sidewall 16 or 19. When the storage module 37 is installed in a recess of a personal computer (or an equivalent opening) the deflection arms 48 are sprung inwardly by the recess sidewalls thereby placing the storage module in compression. If the support module 37 is subsequently withdrawn, deflection arms 48 spring back to their original position.

An additional alternative embodiment of a storage module constructed in accordance with the present invention is shown in FIGURE 6. Storage module 52 of FIGURE 6 (which is shown with the face plate removed), includes sidewalls 16 and 18 that are joined together at their bottom edge by a bottom support plate 54. Projecting outwardly from the sidewalls 16 and 18 are spring members 56 and 58 that differ from the spring members of the previously-described embodiments. Specifically, spring members 56 and 58 include a pair of relatively thin plates 60 and 62 that extend substantially orthogonal away from the outer surface of each sidewall 16 and 18. Relative to the longitudinal direction of sidewalls 16 and 18, plates 60 and 62 are substantially parallel to one another and, in the depicted arrangement, extend along the entire longitudinal sidewall dimension. U-shaped retainers 64 are formed in each of the four corners of plates 60 and 62 that are spaced away from a side wall 16 or 18. In this arrangement, the slot or opening between the legs that define the U-shaped geometry of a retainer 64 faces inwardly toward the opening of an oppositely disposed retainer. That is, the retainers 64 are arranged so that a pair of retainers is located at each end of the channel-like region that is defined between plates 60 and 62.

Retainers 64 are dimensioned and arranged for receiving a leaf spring 68. In the depicted arrangement, leaf spring 69 includes a notch 70 formed in each of its four corners that is received by the slot formed in each of the retainers. When inserted in retainers 64, leaf spring 68 bows outwardly away from the adjacent sidewall (16 or 18) of the storage module 53. When the storage

module 52 is inserted into a recess in a computer, the leaf springs 68 bear against the oppositely disposed sidewalls of the computer recess, thereby securing the storage module 52 in the recess.

Shown in FIGURE 7 is a storage module 72 that includes spring members 74 and 76 which are configured differently than those of the above-discussed embodiments of the present invention. In particular, spring members 74 and 76 respectively extend from the lower and upper edges of both sidewall 16 and 18, with each spring member 74 and 76 being of S-like (serpentine) geometry that positions the outer edges of the spring members in spaced apart juxtaposition with one another. More specifically, each spring member 74 and 76 initially extends away from a sidewall 16 or 18, arcuately extends back toward the associate sidewall for a relatively short distance, and, then arcuately reverses direction to extend away from the sidewall.

When a storage module 72 is inserted in a recess of a computer the edges of spring members 74 and 76 bear against, and are deflected inwardly by, the computer recess sidewalls. Deflection of the spring members in this manner in effect places the storage module in compression to thereby secure the storage module.

While the preferred embodiments of the invention have been illustrated and described, it will be appreciated that various changes can be made therein without departing from the spirit and scope of the invention. For example, various modifications can be made to achieve structure equivalents to the disclosed spring members, each of which bear against the walls of the recess to which installation is made and are deflected inwardly to exert compressive force on the storage module.

Claims

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A storage module for installation in a recess of a computer housing, the recess having two oppositely-disposed parallel spaced-apart sidewalls, said storage module comprising:

(a) a front panel, said front panel including an opening for receiving items to be stored in said storage module;

(b) two side panels, the side panels extending orthogonally from the rear surface of said front panel, one of said side panels being located on one side of said opening and the second of said side panels being located on another side of said opening;

(c) a spring member extending outwardly from at least one of the side panels, said spring member for asserting a force against at least one side wall of the recess in the computer housing to secure the storage module within the computer housing when the storage module is inserted into the recess; and

(d) at least one support panel extending between the side panels, each such support panel being substantially perpendicular to both the side panels and front panel.

2. The storage module of Claim 1 wherein a plurality of said support panels extend in substantially parallel, spaced apart juxtaposition with one another between said sidewalls, the space between adjacent ones of said support panels being dimensioned to allow insertion of a data storage medium.

3. The storage module of Claim 1, wherein at least three support panels extend in substantially parallel, spaced apart juxaposition with one another between said side walls, the space between adjacent ones of said support panels being dimensioned to allow insertion of a data storage medium.

4. The storage module of Claim 3, wherein the space between the side panels and the space between adjacent ones of said support panels is dimensioned to receive floppy disks of standard size selected from the group consisting of 5.25" and 3.5".

5. The storage module of Claim 3, wherein at least a portion of said plurality of support panels include a stop that extends toward an adjacent support panel, said stops being positioned to allow storage of data storage media of different size between different ones of said spaced-apart support plates.

6. The storage module of Claim 1, wherein the spring member includes a leg that projects outwardly from the side panel at an acute angle to bear against at least one wall that defines the recess in the computer housing.

7. The storage module of Claim 1, wherein the spring member includes a leaf spring boxed outwardly to bear against at least one wall that defines the recess in the computer housing.

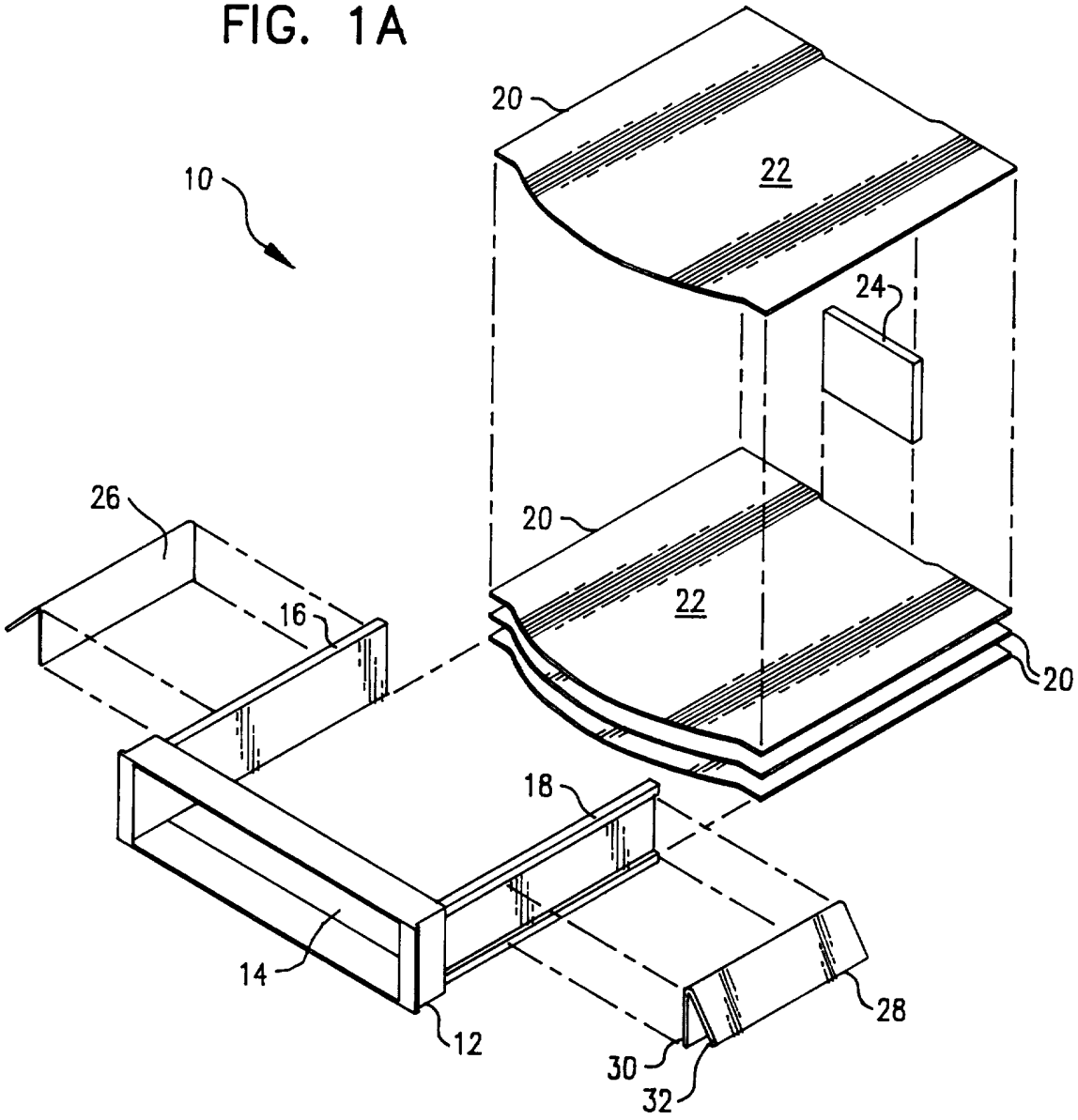
8. The storage module of Claim 1, wherein the spring member includes at least one serpentine bias piece having two ends, one end of the serpentine bias piece being attached to one of the side panels, the serpentine bias piece initially extending away from said side panel, arcuately extending back toward said side panel, and then arcuately extending in the opposite direction, with the second end for bearing against at least one wall that defines the recess in the computer housing.

9. The storage module of Claim 1, further comprising a stop limiting the distance that media can be inserted into the storage module.

10. The storage module of Claim 1, wherein the spacing between the side panels, and each support panel is sized so that CD ROMs of standard size can be inserted through the opening and slid into a position upon a support panel.

11. The storage module of Claim 1, wherein each support panel includes at least one opening, forming a path of fluid communication through the support panel for ventilation.

FIG. 1A



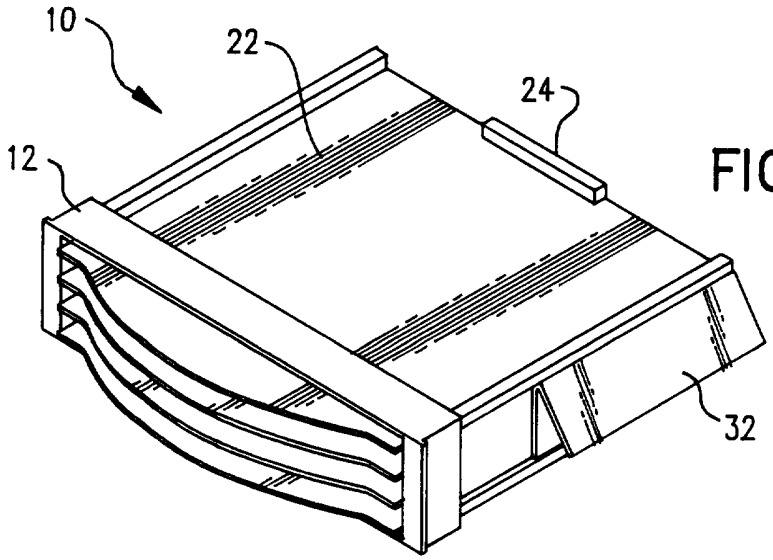


FIG. 2

FIG. 1B

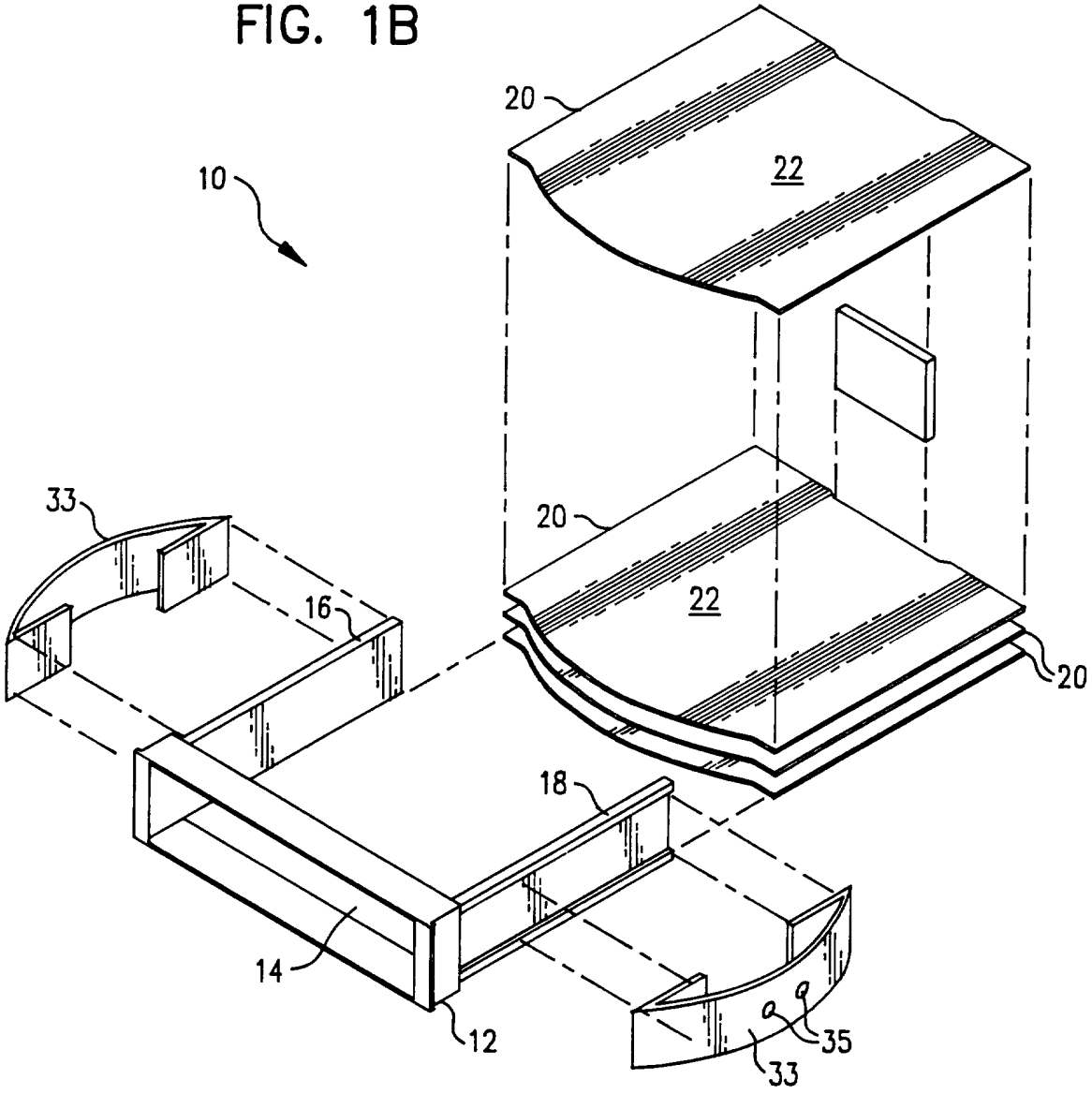


FIG. 3

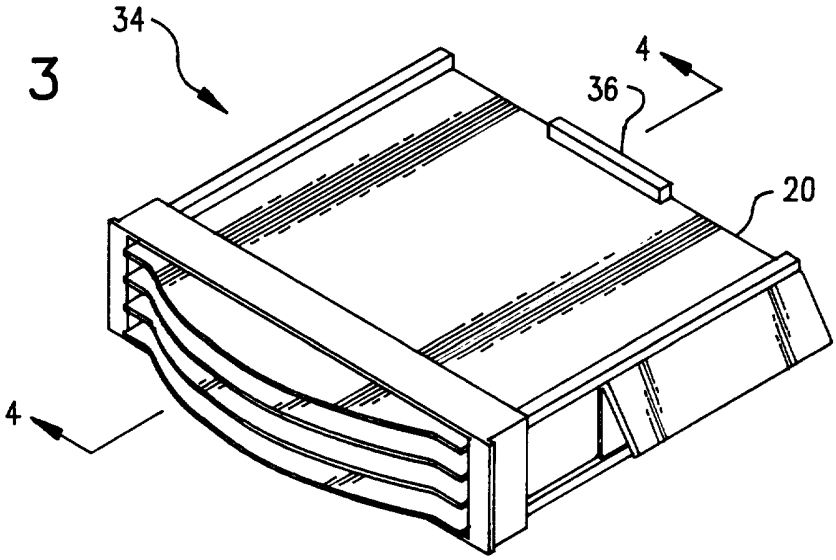


FIG. 4

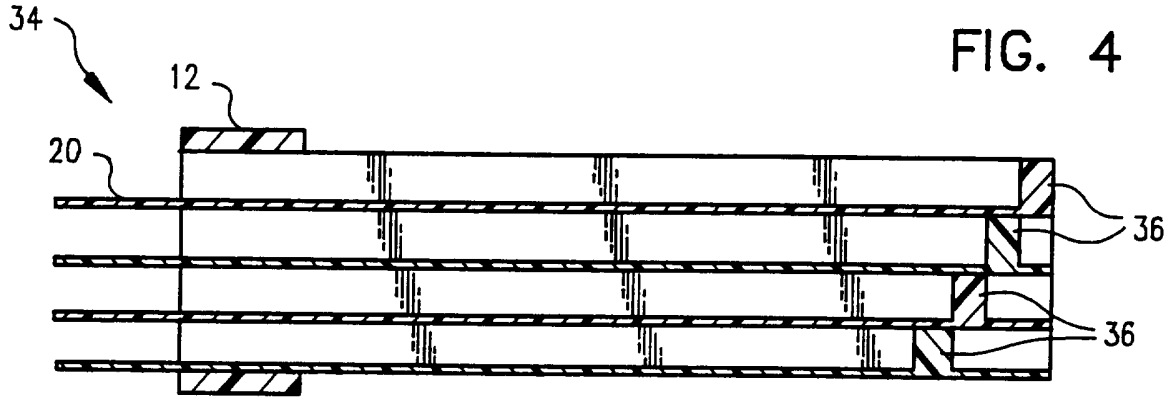
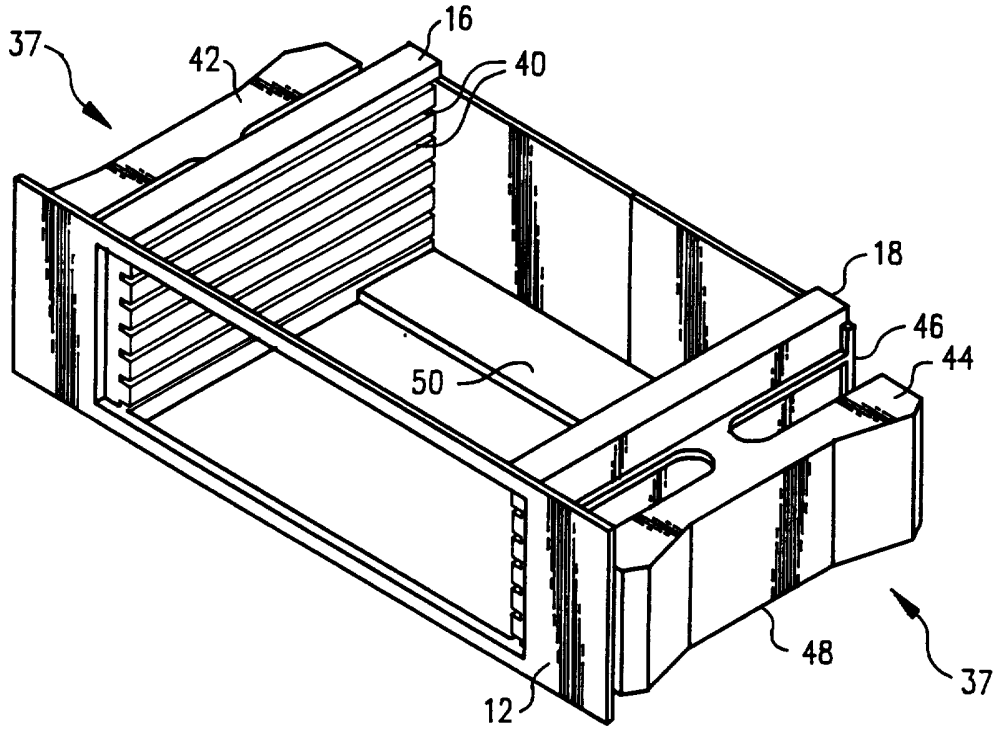


FIG. 5



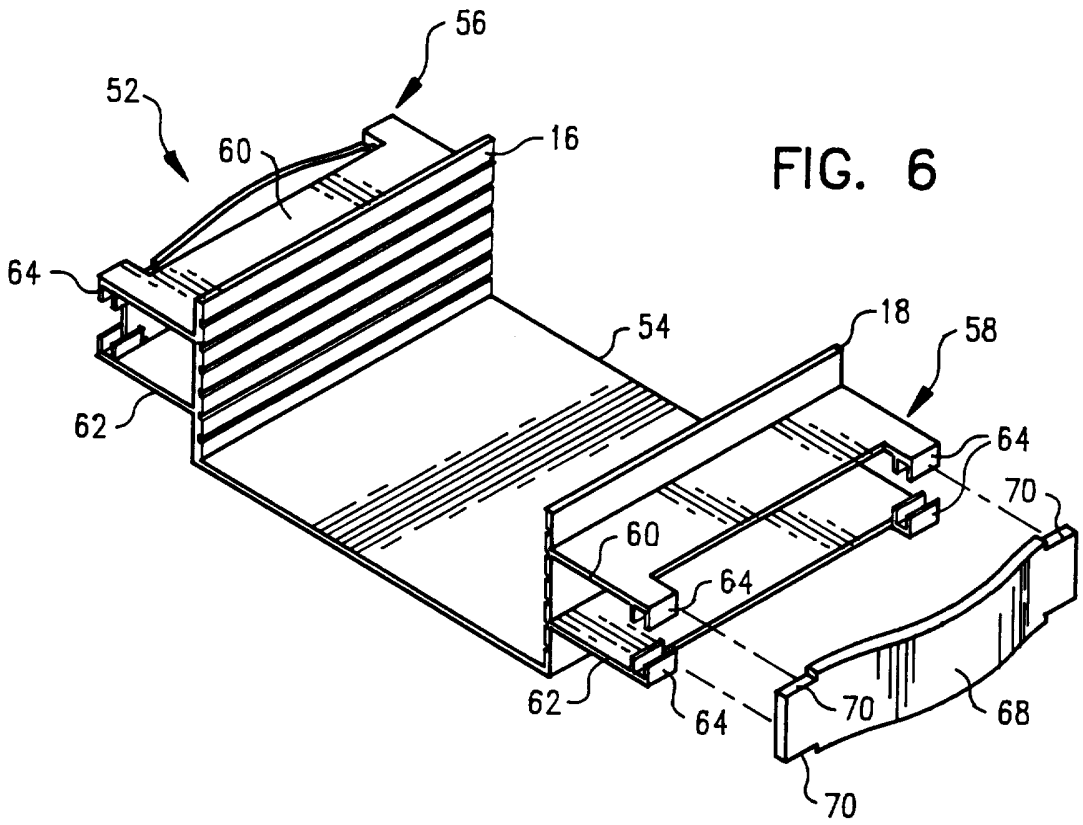


FIG. 6

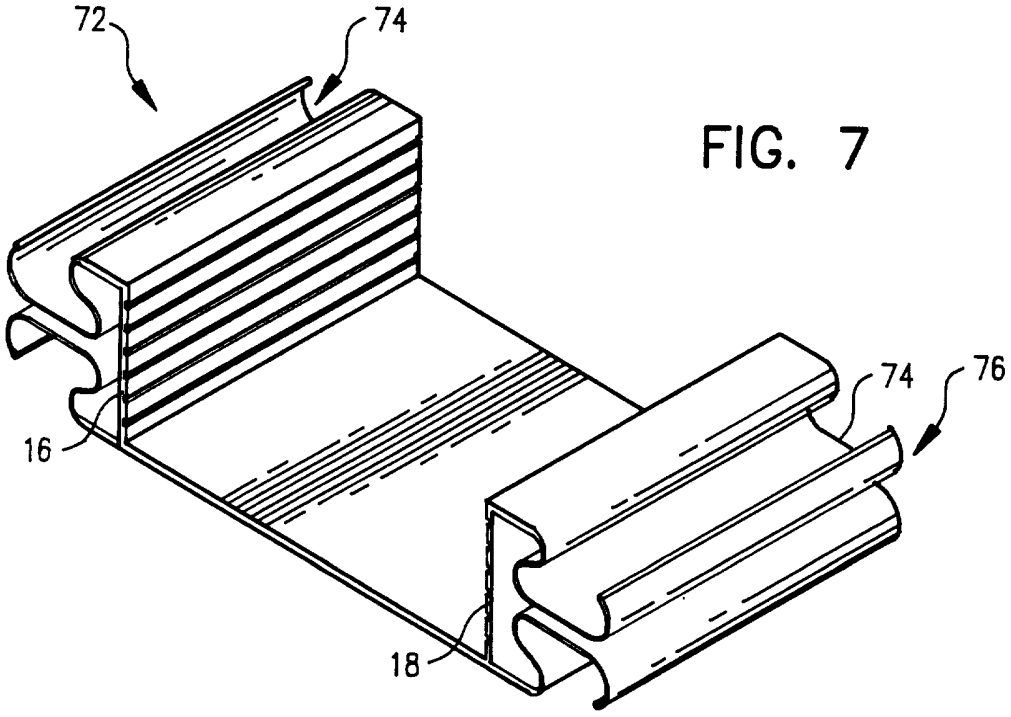


FIG. 7

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US95/10090

A. CLASSIFICATION OF SUBJECT MATTER
IPC(6) :A47B 81/06
US CL : 312/9.48
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 312/9.48, 9.1, 9.47, 9.63, 9.51, 9.57, 330, 332
267/160, 164, 165

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X ----- Y	US, A, 5,080,452 (TUCKMAN) 14 January 1992, col. 3, lines 30-43 and Figure 7.	1, 9-11 ---------- 2-5, 7
X	US, A, 4,811,995 (ACKERET) 14 March 1989, Figures 9-11	1, 6, 9-11
Y,P	US, A, 5,350,068 (CHIENG) 27 September 1994, Figure 2.	2-5
Y	US, A, 5,116,699 (MIYAJIMA) 26 May 1992, Figure 1.	7

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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Date of the actual completion of the international search 18 DECEMBER 1995	Date of mailing of the international search report 29 JAN 1996
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