Aircraft seat mounted connector

An aircraft seat mounted passenger interface apparatus (36) is provided including a seat (12) having an arm portion (28) and a frame (20). The frame (20) is mounted to a floor (22) of the aircraft. A cavity (26) is formed in the arm portion (28) and an internet interface device (36) is disposed within the cavity (26). The internet interface device (36) is operable in a first mode enabling access to an internet connection port and in a second mode preventing access to the internet connection port. Preferably, the internet interface device (36) includes an access panel (52) residing substantially flush with a surface of the arm portion in the second mode. Also, the cable (40) interconnecting the internet interface device (36) with an internet server (41) is preferably routed along the frame (20) of the seat (12).
AIRCRAFT SEAT MOUNTED CONNECTOR

FIELD OF THE INVENTION

[0001] The present invention relates to aircraft based electronic systems and, more particularly, to an aircraft seat mounted passenger interface device.

BACKGROUND OF THE INVENTION

[0002] Many aircraft travelers use personnel computers during the flight. Some of these travelers need internet access while in-route. Unfortunately, most commercial aircraft are not equipped with appropriate internet interface equipment.

[0003] To provide a traveler with internet access on an aircraft, an internet interface device is needed. However, the electronic equipment configuration in the passenger seats is certified as part of a sophisticated seat certification process. The vast majority of modifications and additions to seat-based electronic equipment requires re-certification of the seats. This process can be costly and time consuming. Further, the removal and re-installation of aircraft seats to effect the modification and/or addition is also time-consuming.

[0004] As such, airline customers are sometimes reluctant to accept any seat modifications.

[0004] Notwithstanding the foregoing, certain modifications to aircraft seat-base electronics be accomplished with minor re-certification and may not require removal of the seats. If the modification minimally changes the seat load,
then re-certification can be quickly accomplished. For example, an on-board checklist type inspection may be all that is required.

[0005] Accordingly, it would be desirable to utilize the ashtray receptacle commonly located within an aircraft seat arm as an internet interface receptacle location. Since smoking on most commercial aircraft flights has been banned, this change will not effect travel. Further, since the seat arm is readily accessible, removal of the seat is not required to effectuate the modification. Finally, since the internet interface device adds little or no weight to the passenger seat, re-certification of the seat may not be needed.

10

SUMMARY OF THE INVENTION

[0006] The above and other objects of the present invention are provided by an aircraft seat mounted passenger interface device. More particularly, the seating arrangement includes a seat having an arm portion and a frame. The frame is mounted to a floor of the aircraft. A cavity is formed in the arm portion and an internet interface device is disposed within the cavity. The internet interface device is operable in a first mode enabling access to an internet connection port and in a second mode preventing access to the internet connection port. Preferably, the internet interface device includes an access panel residing substantially flush with a surface of the arm portion in the second mode. Also, the cable interconnecting the internet interface device with an internet server is preferably routed along the frame of the seat.

[0007] Further areas of applicability of the present invention will become apparent from the detailed description provided hereinafter. It should be
understood that the detailed description and specific examples, while indicating the preferred embodiment of the invention, are intended for purposes of illustration only and are not intended to limit the scope of the invention.

5

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The present invention will become more fully understood from the detailed description and the accompanying drawings, wherein:

[0009] Figure 1 is a cross-sectional side view of an aircraft seating arrangement incorporating the teachings of the present invention;

[0010] Figure 2 is a side elevational view of an interface device incorporated into a portion of the aircraft seating arrangement of Figure 1; and

[0011] Figure 3 is a rear elevational view of an alternate embodiment of the interface device of Figure 2.

15

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0012] The following description of the preferred embodiments is merely exemplary in nature and is in no way intended to limit the invention, its application, or uses.

[0013] The present invention is directed towards an airline passenger interface device which is mounted within a cavity in a passenger seat. The cavity is preferably pre-formed in the arm portion of the seat in the form of an ashtray compartment. The internet interface device is pivotably disposed within the cavity such that it is operable in a first mode enabling access to an internet connection port and in a second mode preventing access to the internet
connection port. Advantageously, since the seat arm is readily accessible, removal of the seat is not required to effectuate the modification. Also, since the internet interface device adds little or no weight to the passenger seat, a simplified re-certification process for the seat may be all that is needed.

[0014] Turning now to the drawing figures, Figure 1 illustrates an aircraft seat arrangement generally at 10. Although in a commercial embodiment of the present invention numerous seating units would make up the seat arrangement 10, the seat arrangement 10 illustrated in Figure 1 includes only one seat unit 12. The seat unit 12 includes a seat back 14, a seat arm 16, and a seat bottom 18. The seat unit 12 also includes a rigid frame 20 supporting the remaining seat components. The frame 20 is connected at an upper end to the seat bottom 18 and at a lower end to a floor 22. Although the floor 22 is preferably one found in an aircraft, one skilled in the art will recognize that another environment, such as a bus or train, could substitute therefore.

[0015] The seat arm 16 of the seat unit 12 includes a generally rectangularly shaped major cavity 24 adjacent to a much smaller generally rectangularly shaped minor cavity 26. The major cavity 24 is accessed from an open top by rotating a generally planar arm rest 28 to a first or open mode from a second or closed mode. In the second mode, the arm rest 28 is generally horizontally oriented such that it encloses the major cavity 24 with the remaining elements of the seat arm substructure 30 (i.e., the perimeter wall and substrate). In the first mode, the arm rest 28 is rotated away from the substructure 30 so as to reside essentially vertically to thereby provide access to within the major
cavity 24 through the open top. Items such as a seat tray 32 are commonly removably and/or pivotably stored within the major cavity 24.

[0016] The minor cavity 26 is preferably located adjacent a proximal end of the seat arm 16 relative to the seat back 14. The minor cavity 26 is preferably accessed from a top portion 34 of the seat arm 16 forward of the arm rest 28. Also, the minor cavity 26 is preferably original equipment within a current production seat unit 12. That is, the minor cavity 26 may be pre-formed in the seat arm 16 for use in accommodating an ash tray.

[0017] In this instance, the seat unit 12 may be retrofit by removing and/or modifying the ash tray normally occupying the minor cavity 26 and replacing and/or attaching the internet interface device of the present invention therein. Thus, the seat unit 12 can be said to operate in a first mode accommodating an ash tray in the minor cavity 26, and in a second mode accommodating an internet interface device in the minor cavity 26 (either instead of, or in combination with the original ash tray housing).

[0018] Still referring to Figure 1, an internet interface device 36 is pivotably disposed within the minor cavity 26. The interface device 36 includes an internet connection port in the form of a connector 38 formed therein for connecting to a personal computer (not shown). Although other connectors may be used, it is presently preferred to employ an RJ45 type connector. The interface device 36 is operable in a first or open mode providing access to the connector 38 and in a second or closed mode preventing access the internet connector 38. In the closed mode, the top panel (described in greater detail
below) of the interface device 36 is preferably substantially flush with the top portion 34 of the seat arm 16.

[0019] A flexible cable 40 coupled to the internet connector 38 extends from the interface device 36 to an internet server (not shown) located in a remote location relative to the seat unit 12. Alternatively, the cable 40 may be coupled to a seat box 41 mounted to seat frame 20. The seat box 41 performs many of the functions normally associated with a server.

[0020] The cable 40 preferably extends along the seat frame 20 and through the floor 22. More particularly, the cable 40 extends along an interior portion of the front wall 42 of the seat arm 16, between the seat frame 20 and seat bottom 18, and then along the rear portion 44 of the seat frame 20. Even more particularly, the cable 40 is tie wrapped to an existing seat cable (not shown) past the chord reel interface (also not shown). In this way, the cable 40 does not interfere with passengers neat the seat unit 12.

[0021] Referring now to Figure 2, a more detailed view of the interface device 36 is illustrated. The interface device 36 includes a metal or plastic generally rectangular housing 46 having a preferably planar base 48 coupled to a relatively upstanding perimeter wall 50 extending therefrom. A plastic or metal pivotable panel 52 is pivotally coupled at a rear end 54 to a rear section 56 of the wall 50 by a hinge 57. A slideable guide member 58 in the form of a bar pivotally coupled to the panel 52 at one end and slideably retained in a slotted bracket at an opposite end interconnects the front end 60 of the panel 52 to a front section 62 of the wall 50.
[0022] The housing 46 is nested within the minor cavity 26 in the seat arm 16. A bezel or plate 61 is interposed between the housing 46 and seat arm 16. The plate 61 is only necessary if the size of the opening to cavity 26 is greater than the size of the housing 46 by more than an amount that can be accommodated, i.e., overlaid, by lip 63 of wall 50. Since plate 61 can always include a standard sized aperture formed therein for accommodating the device 36, plate 61 enables a standardized device 36 to be incorporated into various sized cavities 26.

[0023] The connector 38 is mounted to the panel 52 by at least one bracket 64. Alternatively, the connector 38 may be glued, bolted, riveted, or otherwise fixedly or removably secured to the panel 52. Of course, the connector 38 may also be secured to another portion of the housing 46 if desired.

[0024] A biasing member in the form of a spring tab 66 coupled to the lower surface of the connector 38 urges the panel 52 towards an open position. A selectively lockable tab 68 in the form of a spring steel clip normally retains the panel 32 in a closed position against the bias of the spring tab 66. When the lockable tab 68 is released by a user, the panel 52 rises out of the housing 46 to expose the connector 38. While a tab 68 has been described, one skilled in the art will appreciate that a number of other lock/unlock mechanisms could substitute therefore.

[0025] Turning now to Figure 3, an alternate embodiment internet connection device 36a is illustrated in seat arm 16a. As illustrated, the connection device 36a is rotated upwardly relative to seat arm 16a to expose
connector 38a. In this embodiment a double connector 38a is provided to enable multiple users to access the internet through a single internet connection device 36a.

Thus, an internet interface device is provided within an aircraft seat. Advantageously, the device may be retrofit into existing seats without requiring removal of the seats. Moreover, the modification of the seats so insignificantly effects seat load that the seat may not need re-qualification for forward crash loads.

The description of the invention is merely exemplary in nature and, thus, variations that do not depart from the gist of the invention are intended to be within the scope of the invention. Such variations are not to be regarded as a departure from the spirit and scope of the invention.
-9-

CLAIMS

What is claimed is:

1. An interface device for an aircraft comprising:
   a housing mountable within an aircraft seat; and
   an internet connector disposed within said housing.

2. The interface device of Claim 1 wherein said housing further
   comprises a panel operable in a first mode enabling access to said connector
   and in a second mode preventing access to said connector.

3. The interface device of Claim 2 wherein said panel is pivotable.

4. The interface device of Claim 2 wherein said housing further
   comprises a base and a wall coupled to and extending away from said base,
   said panel being connected to said wall.

5. The interface device of Claim 4 wherein said panel of said housing
   resides substantially flush with a surface of said seat in said second mode.

6. The interface device of Claim 2 further comprising a slideable
   guide member interconnecting said panel and said housing.
7. The interface device of Claim 2 further comprises a biasing member urging said connector into said first mode.

8. The interface device of Claim 7 wherein said biasing member further comprises a spring.

9. The interface device of Claim 1 further comprising a cable interconnecting said connector with an internet server.

10. A seating unit comprising:

   a passenger seat; and

   at least one internet interface device coupled to said passenger seat.

11. The seating unit of Claim 10 wherein said passenger seat includes an arm portion and said internet interface device is coupled to said arm portion.

12. The seating unit of Claim 11 wherein said internet interface device is disposed within a cavity formed within said arm portion.

13. The seating unit of Claim 10 wherein said internet interface device further comprises a housing including a panel operable in a first mode enabling access to a connector of said internet interface device and in a second mode preventing access to said connector.
14. The seating unit of Claim 13 wherein said panel is pivotable.

15. The seating unit of Claim 13 wherein said panel resides substantially flush with a surface of said seat in said second mode.

16. The seating unit of Claim 13 further comprising a biasing member urging said connector into said first mode.

17. The seating unit of Claim 10 further comprising a cable interconnecting said internet interface device with an internet server, said cable being routed along a frame of said seat.

18. A seating arrangement for an aircraft comprising:

    15 a seat including an arm portion and a frame, said frame being mounted to a floor of said aircraft;

    15 a cavity formed in said arm portion; and

    20 an internet interface device disposed within said cavity, said device being operable in a first mode enabling access to an internet connection port of said internet interface device and in a second mode preventing access to said internet connection port.
19. The seating arrangement Claim 18 wherein said internet interface device includes an access panel residing substantially flush with a surface of said arm portion in said second mode.

20. The seating arrangement of Claim 18 further comprising a cable interconnecting said internet interface device with an internet server, said cable being routed along said frame of said seat.
A. CLASSIFICATION OF SUBJECT MATTER

IPC 7: B64D11/00  B64D11/06

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)

IPC 7: B64D H02G

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 practical, search terms used)

PAJ, WIPI Data, EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>DE 34 16 486 A (ELETTROCONDUTTURA)</td>
<td>1-9</td>
</tr>
<tr>
<td></td>
<td>22 November 1984 (1984-11-22)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>the whole document</td>
<td>11-16,</td>
</tr>
<tr>
<td></td>
<td>figures</td>
<td>18-20</td>
</tr>
<tr>
<td></td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>EP 0 926 065 A (RAJASINGHAM ARJUNA)</td>
<td>1,10,17</td>
</tr>
<tr>
<td></td>
<td>INDRAESWARE) 30 June 1999 (1999-06-30)</td>
<td></td>
</tr>
<tr>
<td>Y</td>
<td>column 10, line 29 – line 40</td>
<td>11-16,</td>
</tr>
<tr>
<td></td>
<td>---</td>
<td>18-20</td>
</tr>
<tr>
<td>A</td>
<td>US 4 509 097 A (ROBINSON RONNIE D)</td>
<td>1,10,18</td>
</tr>
<tr>
<td></td>
<td>2 April 1985 (1985-04-02)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>figures</td>
<td></td>
</tr>
<tr>
<td></td>
<td>---</td>
<td></td>
</tr>
</tbody>
</table>

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

*A* Special categories of cited documents:

*A* document defining the general state of the art which is not considered to be of particular relevance

*E* earlier document but published on or after the international filing date

*L* document which may throw doubt on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

*O* document referring to an oral disclosure, use, exhibition or other means

*P* document published prior to the international filing date but later than the priority date claimed

*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

*Y* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

*A* document member of the same patent family

Date of the actual completion of the international search: 16 September 2002

Date of mailing of the international search report: 02/10/2002

Name and mailing address of the ISA

European Patent Office, P.B. 5016 Patentlaan 2
NL-2280 HV Rijswijk
Tel. (+31-70) 340-2046, Tx. 31 651 epo nl,
Fax (+31-70) 340-5016

Authorized officer

Estrela y Calpe, J

Form PCT/ISA/210 (second sheet) (July 1992)
<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>KELLY E: &quot;IN-FLIGHT E-MAIL RACE INTENSIFIES&quot; FLIGHT INTERNATIONAL, REED BUSINESS INFORMATION, HAYWARDS HEATH, GB, vol. 158, no. 4749, 3 October 2000 (2000-10-03), page 40 XP000963776 ISSN: 0015-3710 the whole document</td>
<td>1,10</td>
</tr>
<tr>
<td>A</td>
<td>US 6 016 016 A (MUIRHEAD ANDREW ET AL) 18 January 2000 (2000-01-18) abstract figures 1,2</td>
<td>1,10,18</td>
</tr>
<tr>
<td>Patent document cited in search report</td>
<td>Publication date</td>
<td>Patent family member(s)</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>EP 0926065 A2</td>
<td>30-06-1999</td>
<td></td>
</tr>
<tr>
<td>US 4509097 A</td>
<td>02-04-1985</td>
<td>NONE</td>
</tr>
<tr>
<td>EP 0881145 A2</td>
<td>02-12-1998</td>
<td></td>
</tr>
<tr>
<td>JP 11126660 A</td>
<td>11-05-1999</td>
<td></td>
</tr>
</tbody>
</table>