Title: COVER FOR A SEAT IN AN AIRCRAFT OR SPACECRAFT

Abstract: The present invention provides a cover (10) for a seat in an aircraft or spacecraft, comprising a receiving means (40) which is configured to receive in an exchangeable manner an electronic device (50) which is fitted with a screen, at least one recess (30) being provided in the region of the receiving means (40) such that the screen of the electronic device (50) is exposed for viewing.
Cover for a seat in an aircraft or spacecraft

The present invention relates to a cover for a seat in an aircraft or spacecraft.

Although the present invention can be applied to any seat covers in an aircraft or spacecraft, the invention and the problem it addresses will be described in detail in respect of an aircraft.

Seat covers in aircraft are usually arranged in the region of the headrests of the seats and are placed over the headrest. The general purpose of seat covers is to physically separate a contact region of the passenger with the headrest from the surface of the headrest, thereby avoiding direct contact between the passenger and the headrest for reasons of hygiene. This is particularly in view of the fact that during long-haul flights, the headrest is preferably used for supporting the passenger’s head while he/she sleeps, and the use of the seat cover is to prevent the headrest from becoming soiled by the passenger.

From the prior art, US 2004/0182485 A1 discloses a removable cover for a seat, which cover offers a large selection of motifs printed on the surface. The cover is joined to the headrest of the seat by a plurality of Velcro® fastenings. If a display device, for example a screen, is present in the region of the seat cover, individual Velcro® fastenings can be selectively undone and the corresponding portion of the seat cover is thereby removed from the region of the display device. A disadvantage of this arrangement is that the seat cover does not afford any possibility of attaching a display device if such a device is not provided on the headrest.

It is therefore the object of the present invention to provide a cover for a seat in an aircraft or spacecraft, which cover can be used with a display device and can be easily retrofit for existing seats in an aircraft or spacecraft.

This object is achieved according to the invention by the seat cover having the features of claim 1.

According thereto, a seat cover with a recess is provided which has a receiving means for receiving an electronic device fitted with a screen, a receiving means for receiving the screen of the electronic device being provided in the region of the recess.

The fundamental idea of the present invention is that the seat cover acquires an additional functionality by receiving the electronic device, the seat cover having a recess so that the electronic device can be observed, and the electronic device can be attached onto the seat by means of the seat cover.
An advantage of the present invention is that the airline is now able to offer electronic entertainment devices in the seat cover, the use of which is not subject to strict approval tests, as is the case for head impact situations. Furthermore, by means of the present seat cover, the airline can use so-called COTS devices (commercial-off-the-shelf devices, i.e. commercially available devices) with a substantially more favourable cost price compared to monitors of the in-flight entertainment system, which hitherto have been fixedly installed in the rearward region of the aircraft seat.

Furthermore, with the present seat cover it is possible to provide the passenger with an electronic device, and no modifications whatsoever have to be made to the aircraft seat in order to attach the device to said seat. Consequently, the present seat cover can easily be retrofit to existing aircraft seats which have a headrest. Moreover, the seat cover can be secured by a fastening mechanism (for example by means of Velcro® fastenings) to the headrest of the seat such that the seat cover can invariably be adapted to different sizes of headrest.

In addition thereto, advantageously the electronic device can easily be adapted to the respective state of the art by the exchange thereof, so that the airline can react within the shortest possible time to the relatively short innovation cycles of an electronic device of this type.

The present seat cover should generally consist of a non-rigid material, i.e. no bending moments can be transferred by the material. Thus, the seat cover can consist of a cloth material or of a woven fabric, for example.

Advantageous configurations and improvements of the invention are set out in the subclaims.

According to a preferred configuration, the receiving means is arranged inside the seat cover. This measure advantageously prevents the unauthorised removal of the device by the passenger.

According to a further preferred configuration, the receiving means is arranged on the outside of the seat cover. This makes it possible for the passenger to accommodate an electronic device which he/she has brought on board, or to accommodate a so-called personal electronic device (PED) in the receiving means and to use the functions thereof as well as the content located thereon during the flight.
According to a further preferred configuration, the receiving means is configured such that the electronic device is received in the receiving means in an exchangeable manner. Thus, the electronic device accommodated in the present seat cover can be exchanged for any newer model.

According to a further preferred configuration, the receiving means is configured to receive an electronic device in the form of a tablet PC or a PDA. The use of a tablet PC or of a PDA for the electronic device quite substantially reduces the cost price thereof compared to a screen and the components of a conventional IFE system, because these are products which are manufactured for the mass market and hence can be supplied cheaply. Furthermore, by now the screens of entertainment devices of this type are large enough to allow films to be presented thereon in an appropriately high resolution. Due to the continuous development and the strong competition of electronic devices of this type, relatively short innovation cycles exist for these products, so that while sitting in the aircraft seat, the passenger can avail himself/herself in each case of the additional facilities of the relatively new devices.

According to a further preferred configuration, the receiving means is configured in the manner of a pocket for holding the electronic device. Consequently, the receiving means can be configured in a constructively simple manner and can be arranged in the region of the inside as well as in the region of the outside of the seat cover. Furthermore, the pocket configuration makes it particularly easy for a PED device to be accommodated in an additional receiving means, thereby enhancing the use for the passenger.

According to a further preferred configuration, the pocket has a closing means which is configured such that it protects the electronic device accommodated in the pocket against theft. A closing means of this type can be realised, for example, by a strap with a lock arranged on the inside to join the closing means to the seat cover.

According to a further preferred configuration, the receiving means is arranged on the side remote from the contact region between the seat cover and a passenger. The device is thus arranged in the rearward region of the headrest of the aircraft seat, so that it can easily be seen by the respective passenger.

According to a further preferred configuration, the receiving means is configured to provide a plurality of inserts for receiving the electronic device. Each individual insert is preferably configured to be able to receive a respective electronic device with predetermined
dimensions. The inserts are each arranged such that they adjoin one another and are staggered in one direction, in particular in the depth direction and they preferably allow the electronic device to be removed from and inserted into the receiving means in each case in one direction, preferably in a vertical direction or sideways.

According to a further preferred configuration, the seat cover has fastening elements for joining the cover to the seat, which fastening elements are configured and shaped such that they are used to attach the cover to seats which have differing dimensions. In particular, these fastening elements are used to join the seat cover to headrests with differing dimensions.

According to a further preferred configuration, the receiving means is joined to the seat cover such that the receiving means is configured to be adjustable with respect to the seat cover. Thus, a hinge arrangement can preferably be arranged on the receiving means which joins together the receiving means and the seat cover so that, during operation, the electronic device can be swivelled along a swivel axis. As a result, the electronic device can be swivelled within a specific swivel angle range towards or away from the passenger, which is particularly advantageous in a situation in which the seat belonging to the cover is adjusted.

According to a further preferred configuration, the receiving means is configured to provide an adapter for receiving the electronic device. The receiving means is thereby able to receive electronic devices with differing dimensions. An adapter of this type can be realised, for example as a casing which bridges a distance between the outer surface of the electronic device and the receiving means in a vertical and/or horizontal direction. In an equivalent alternative, a plurality of separate components can also be used for receiving and securing the electronic device in the receiving means.

According to a further preferred configuration, the seat cover can be connected to an electrical power supply of the seat and the receiving means is configured such that it has an electric interface to the electrical energy supply of the electronic device. Consequently, during the flight, the electronic device can advantageously be supplied with electrical energy for the operation thereof and for charging the energy storage thereof. The interface used for charging the electronic device is preferably a standardised interface, for example a USB interface.

According to a further preferred configuration, the seat cover realises an enlarged presentation of the screen of the electronic device. Advantageously, this makes it possible
for the passenger to view an enlarged picture presented by the electronic device, thereby enhancing passenger comfort.

According to a further preferred configuration, the receiving means can comprise a protective element which is to protect the screen of the electronic device and is arranged in the region of the outside of the receiving means or in the region of the inside of the seat cover. In this respect, the protective element can be, for example, a safety screen which consists of Plexiglas® or of a transparent plastics material. Furthermore, the surface of the protective element can be substantially reflection-free.

Furthermore, a seat having at least one cover according to the present invention is claimed.

An aircraft or spacecraft having a seat according to the present invention is also claimed.

In the following, the invention will be described in more detail on the basis of embodiments with reference to the accompanying figures of the drawings.

Fig. 1 is a schematic perspective view of a seat cover according to the present invention;

Fig. 2 is a schematic perspective view of the seat cover according to Fig. 1;

Fig. 3 is a schematic perspective view of a further seat cover; and

Fig. 4 is a schematic perspective view of a seat with a respective cover according to Fig. 3.

Fig. 1 is a schematic perspective view of a seat cover 10 according to the invention which can be joined to the region of a headrest (not shown) of an aircraft seat (not shown). The seat cover 10 is preferably joined to the aircraft seat by being placed over the headrest. The seat cover 10 has a body 20 as a thin flat body which is substantially rectangular in shape. The cover body 20 consists of a non-rigid material so that it can easily adapt to the shape of the headrest.

Provided in the region of the sides of the cover body 20 are respective closing tapes 60 which are configured to form with the cover body 20 a closed periphery around the peripheral region of the headrest. When the seat cover 10 is joined to the headrest, the lateral regions of the headrest are not covered by the seat cover 10, except for the region of
the closing tapes 60 arranged on the sides in each case. However, in an equivalent alternative, the lateral regions of the headrest can also be covered by the seat cover 10.

In the region of one side, the cover body 20 has a recess 30 which is substantially rectangular in shape. The recess 30 extends in the longitudinal direction of the cover body 20 starting from the central region thereof towards the respective longitudinal edges of the seat cover 10 over a predetermined length. Arranged in the inner surface region of the cover body 20, in the region of the recess 30 is a receiving means 40 which is provided for receiving an electronic video or entertainment device (not shown).

When the seat cover 10 is joined as intended to the headrest, the recess 30 and the receiving means 40 are located in the rearward region of the aircraft seat.

Fig. 2 is a schematic perspective view of the seat cover according to Fig. 1 from the opposite side, part of an electronic device 50 having been received by the receiving means 40. An arrow indicates the insertion direction of the electronic device 50 into the receiving means 40.

The electronic device 50 is preferably a so-called commercial-off-the-shelf device (COTS device), i.e. a commercially available device. The distance between the receiving means 40 and the electronic device 50 in a vertical direction during the introduction of the electronic device 50 is selected such that the electronic device 50 can be inserted without difficulty.

The receiving means 40 also has an interface (not shown) for charging the electronic device 50 as soon as the electronic device 50 has been fully inserted into the receiving means 40. Furthermore, a display (not shown) can be provided which indicates to the passenger the prevailing electrical charge of the electronic device 50.

The receiving means 40 receives the front and back of the electronic device 50 in each case via a contact region, so that the electronic device 50 is received in a substantially clearance-free manner in the transverse direction when it is being received by the receiving means 40.

The receiving means 40 has two window-shaped elements 70 which are arranged parallel to one another and at a distance from one another, the distance thereof substantially corresponding to the thickness of the electronic device 50. The receiving means 40 is formed in the region of the upper side and lower side thereof in each case by parallel u-shaped elements (not shown), the distance of which substantially corresponds to the height of the electronic device 50.
Fig. 3 is a schematic perspective view of a further seat cover according to the present invention, which can be joined to the region of a headrest (not shown) of an aircraft seat (not shown). The seat cover 10 is preferably joined to the aircraft seat by being placed over the headrest. The seat cover 10 has a body 20 as a thin flat body which is substantially rectangular in shape. The cover body 20 consists of a non-rigid material so that it can easily adapt to the shape of the headrest.

Provided in the region of the sides of the cover body 20 are respective closing tapes 60 which are configured to form with the cover body 20 a closed periphery around the peripheral region of the headrest. When the seat cover 10 is joined to the headrest, the lateral regions of the headrest are not covered by the seat cover 10, except for the region of the closing tapes 60 arranged on the sides in each case. However, in an equivalent alternative, the lateral regions of the headrest can also be covered by the seat cover 10.

In the region of one side, the seat cover 20 has a receiving means in the manner of a pocket 80 which has an interior for receiving an electronic device (not shown). The outside of the pocket 80 also has a recess 30 which is substantially rectangular in shape. The recess 30 extends in the longitudinal direction of the pocket 80 starting from the central region thereof towards the respective longitudinal ends of the pocket 80 over a predetermined length which substantially corresponds to the size of the screen of the electronic device.

The pocket 80 and the seat cover body 20 are joined together by a swivel means 81 which is arranged in the region of the upper end of the pocket 80. The pocket 80 can thereby be swivelled with respect to the seat cover 10, as a result of which the passenger always has an optimum view of the recess 30. Arranged in the region of the upper side of the pocket 80, in the central region thereof, is a strap 82 which is used to secure the electronic device which can be received in the pocket 80.

When the seat cover 10 is joined as intended to the headrest, the recess 30 and the pocket 80 are located in the rearward region of the aircraft seat.

In the region below the first pocket 80, the seat cover body 20 has a receiving means in the manner of a second pocket 90 which has an interior for receiving a further electronic device (not shown). The further electronic device is preferably a PED device, such as an iPhone or a device configured for the playback of multimedia content.

The outside of the second pocket 90 also has a second recess 91 which is substantially rectangular in shape. The second recess 91 extends in the longitudinal direction of the
second pocket 90 starting from the central region thereof towards the respective longitudinal edges of the second pocket 90 over a predetermined length which substantially corresponds to the size of the screen of the further electronic device.

The second pocket 90 and the seat cover body 20 are joined together by a second swivel means 92 which is arranged in the region of the upper end of the second pocket 90. The second pocket 90 can thereby swivel with respect to the seat cover 10, so that the passenger has an optimum view of the second recess 91 at all times.

The dimensions both in the longitudinal direction and in the transverse direction of the second pocket 90 amount to only a fraction of the respective longitudinal and transverse dimensions of the first pocket 80.

Fig. 4 is a schematic perspective view of a seat 100 which comprises three aircraft seats arranged next to and adjoining one another. Each aircraft seat has a respective cover 10 according to the present invention. The seat cover 10 has a receiving means 40 which is joined to the body of the seat cover 10 such that the receiving means 40 is configured to be adjustable with respect to the seat cover body. The receiving means 40 thus has a hinge device (not shown), by which the electronic device 50 can be swivelled relative to the seat cover 10 towards or away from the passenger (not shown), as respectively indicated by the arrows.

Although the present invention has been described above on the basis of preferred embodiments, it is not restricted thereto, but rather can be modified in many different ways. For example, the receiving means 40 can have on the outside a protective element formed from a transparent material. Furthermore, the surface of the protective element can be configured such that it is substantially reflection-free.
List of reference numerals

10    seat cover
20    seat cover body
30    recess
40    receiving means
50    electronic device
60    closing tape
70    elements
80    first pocket
81    swivel means
82    strap
90    second pocket
91    second recess
92    second swivel means
100   seat
Claims

1. Cover (10) for a seat in an aircraft or spacecraft comprising a receiving means (40) which is configured to receive in an exchangeable manner an electronic device (50) which is fitted with a screen, wherein at least one recess (30) is provided in the region of the receiving means (40) such that the screen of the electronic device (50) is exposed for viewing.

2. Seat cover according to claim 1, characterised in that the receiving means (40) is arranged inside the seat cover (10).

3. Seat cover according to claim 1, characterised in that the receiving means (40) is arranged on the outside of the seat cover (10).

4. Seat cover according to at least one of the preceding claims, characterised in that the receiving means (40) is configured such that the electronic device (50) is received in the receiving means (40) in an exchangeable manner.

5. Seat cover according to at least one of the preceding claims, characterised in that the receiving means (40) is configured to receive an electronic device (50) configured as a tablet PC or as a PDA.

6. Seat cover according to at least one of the preceding claims, characterised in that the receiving means (40) is configured in the manner of a pocket (80) for holding the electronic device (50).

7. Seat cover according to claim 6, characterised in that the pocket (80) comprises a closing means which is configured such that it protects the electronic device (50) accommodated in the pocket (80) against theft.

8. Seat cover according to at least one of the preceding claims, characterised in that the receiving means (40) is arranged on the side remote from the contact region between the seat cover (10) and a passenger.

9. Seat cover according to at least one of the preceding claims, characterised in that the receiving means (40) is configured to provide an adapter, particularly in the manner of a casing, for receiving the electronic device (50).
10. Seat cover according to at least one of the preceding claims, characterised in that the seat cover (10) has fastening elements (60) for joining the cover (10) to the seat, said fastening elements (60) being configured and shaped such that they are used to attach the cover (10) to seats of different dimensions.

11. Seat cover according to at least one of the preceding claims, characterised in that the receiving means (40) is joined to the seat cover (10) such that the receiving means (40) is configured to be adjustable with respect to the seat cover (10).

12. Seat cover according to at least one of the preceding claims, characterised in that the seat cover (10) can be connected to an electrical power supply of the seat, and the receiving means (40) is configured such that it has an electric interface to the electrical power supply of the electronic device (50).

13. Seat cover according to at least one of the preceding claims, characterised in that the seat cover (10) provides an enlarged presentation of the screen for the electronic device (50).

14. Seat with a cover according to at least one of the preceding claims.

15. Aircraft or spacecraft having at least one seat according to claim 14.
## INTERNATIONAL SEARCH REPORT

**INTERNATIONAL APPLICATION**

**Official Search Report**

**Applicant**

**Inventor**

**Prior International Applications**

**Prior International Search Reports**

**References Cited**

**Search Report**

**Search Authority**

**Date of the international search**

**Date of mailing of the international search report**

**Name and mailing address of the ISA**

**Authorized officer**

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**A. CLASSIFICATION OF SUBJECT MATTER**

**INV.** B64D11/00 B64D11/06

**ADD.**

According to International Patent Classification (IPC) into both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

B64D A47C B60N B60R

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)

EPO-Internal, WPI Data

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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**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**

**21/12/2012**

**Date of mailing of the international search report**

**21/12/2012**

**Name and mailing address of the ISA**

European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk

Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016

**Authorized officer**

Pedersen, Kenneth
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