

A HEADREST SUPPORT ASSEMBLY

FIELD OF INVENTION

[0001] The present invention relates broadly, but not exclusively, to a headrest support assembly and methods of manufacturing and using the same.

BACKGROUND

[0002] A typical seat headrest, such as an aircraft seat headrest, may cater to people of different heights by using sliding mechanisms, such as a rail and track system, a guided rail or a guided rod system, that allow the headrest to travel vertically at a fixed distance. However, the fixed distance of these systems are limited due to dimensional constraints of the seat and the sliding mechanism. In order to provide a wider range of people with different heights, a conventional solution may be to increase the vertical distance by lengthening the rail and track system, the guided rail or the guided rod system.

[0003] However, increasing the length of the track or rails of sliding mechanisms may not be practical, especially for shorter users, as having longer sliding mechanisms may add weight to the headrest and seat. In addition, the track, rails or rod may impede the comfort of the user and the aesthetics of the seat may be greatly reduced.

[0004] Accordingly, a need exists to provide a headrest support assembly that seeks to address some of the above problems.

SUMMARY

[0005] According to a first aspect of the present invention, there is provided a headrest support assembly comprising: a hinge member connected to a seatback; and a chassis pivotably mounted to the hinge member; wherein the chassis is pivotable between a first position in which the chassis is generally higher than the hinge

member and a second position in which the chassis is generally lower than the hinge member.

[0006] The chassis may include a rectangular plate comprising two horizontal edges and two side edges, and wherein the chassis is pivotally mounted to the hinge member along a horizontal edge of the rectangular plate.

[0007] The headrest support assembly may further include first and second side plates each pivotally mounted to the rectangular plate along a respective side edge of the rectangular plate.

[0008] The headrest support may further include a cushion member removably attached to the chassis, wherein, relative to a forward direction of the seatback, a profile of the cushion member in the first position is substantially the same as a profile of the cushion member in the second position.

[0009] The hinge member may be slidable relative to a guide extending along a height direction of the seatback.

[0010] A seatback comprising the headrest support assembly as disclosed in the first aspect.

[0011] According to a second aspect of the present invention, there is provided a method of manufacturing a headrest support assembly, the method comprising: connecting a hinge member to a seatback; and pivotally mounting a chassis to the hinge member such that the chassis is pivotable between a first position in which the chassis is generally higher than the hinge member and a second position in which the chassis is generally lower than the hinge member.

[0012] The step of pivotally mounting the chassis to the hinge member may include mounting along a horizontal edge of the rectangular plate.

[0013] The method may further include pivotally mounting first and second side plates to the rectangular plate each along a respective side edge of the rectangular plate.

[0014] The method may further include removably attaching a cushion member to the chassis such that relative to a forward direction of the seatback, a profile of the

cushion member in the first position is substantially the same as a profile of the cushion member in the second position.

[0015] The step of connecting the hinge member to the seatback may include connecting the hinge member to a guide extending along a height direction of the seatback such that the hinge member is slidable relative to the guide.

[0016] According to a third aspect of the present invention, there is provided a height adjustment method for a headrest support assembly, the method comprising: providing the headrest support assembly as disclosed in the first aspect; sliding the hinge member of the headrest support assembly relative to a guide extending along a height direction of a seatback to a selected height; and pivoting the chassis of the headrest support assembly either the first position in which the chassis is generally higher than the hinge member or the second position in which the chassis is generally lower than the hinge member.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] Embodiments of the invention will be better understood and readily apparent to one of ordinary skill in the art from the following written description, by way of example only, and in conjunction with the drawings, in which:

[0018] Fig. 1 shows a perspective view of a headrest support assembly, according to an example embodiment.

[0019] Fig. 2A shows a perspective view of the headrest support assembly of Fig. 1 with the chassis at a first position, according to an example embodiment.

[0020] Fig. 2B shows a perspective view of the headrest support assembly of Fig. 1 with the chassis at a second position, according to an example embodiment.

[0021] Fig. 3A shows a perspective view of the headrest support assembly of Fig. 1 with the first and second side plates pivoted forward of the chassis, according to an example embodiment.

[0022] Fig. 3B shows a perspective view of the headrest support assembly of Fig. 1 with the first and second side plates pivoted aft of the chassis, according to an example embodiment.

[0023] Fig. 4 shows a perspective cross-sectional view of the headrest support assembly of Fig. 1, according to an example embodiment.

[0024] Figs. 5A to 5C show a perspective view of the headrest support assembly of Fig. 1 at various heights on a guide, according to an example embodiment.

[0025] Figs. 6A to 6C show a perspective view of the headrest support assembly of Fig. 1 at various heights on a guide, according to an example embodiment.

[0026] Fig. 7 shows a flowchart illustrating a method for manufacturing a headrest support assembly, according to an example embodiment.

[0027] Fig. 8 shows a flowchart illustrating a height adjustment method for a headrest support assembly, according to an example embodiment.

DETAILED DESCRIPTION

[0028] The following detailed description is merely exemplary in nature and is not intended to limit the invention or the application and uses of the invention. Furthermore, there is no intention to be bound by any theory presented in the preceding background of the invention or the following detailed description. Herein, a headrest support assembly is presented in accordance with present embodiments which may have the advantages of overcoming the limited vertical distance of rail and track systems, guided rails or guided rods in current headrests. In addition, embodiments of the present invention may allow a user to use the headrest on either surface when the headrest is flipped up or down.

[0029] Fig. 1 shows a perspective view of a headrest support assembly 100, according to an example embodiment. The headrest support assembly 100 includes a chassis 102 that is pivotably mounted on a hinge member 104, a first side plate 106a and a second side plate 106b. In this example, the chassis 102 comprises a rectangular plate comprising two horizontal edges 108 and two side edges 110a, 110b such that the chassis 102 is pivotably mounted to the hinge member 104 along a horizontal edge 108 of the rectangular plate. However, it will be appreciated that the chassis may have different shapes in alternate embodiments. The chassis 102 is pivotable between a first position in which the chassis 102 is generally higher than the hinge member 104 and a second position in which the chassis 102 is generally lower than the hinge member 104. In the Figure, the chassis 102 is in the first position whereby it is higher than the hinge member 104. The chassis 102 also has a forward facing surface and an aft facing surface (not shown).

[0030] The first side plate 106a and the second side plate 106b are each pivotally mounted to the rectangular plate along a respective side edge 110 of the rectangular plate. The first side plate 106a has a front support surface 112a and an aft support surface (as shown in Fig. 3A) relative to a forward direction of a seatback (as shown in Fig. 2A). Similarly, the second side plate 106b has a front support surface 112b and an aft support surface (as shown in Fig. 3A) relative to a forward direction of a seatback (as shown in Fig. 2A). The first side plate 106a and the second side plate 106b may be cushioned at the front support surfaces 112a, 112b and the aft support surfaces respectively. In the Figure, the first side plate 106a and the second side plate 106b are in a position whereby the front support

surfaces 112a, 112b of each of the first and second plates 106a, 106b are spaced apart with the chassis 102 therebetween.

[0031] Fig. 2A shows a perspective view 200 of the headrest support assembly 100 of Fig. 1 with the chassis 102 at a first position, according to an example embodiment. In the Figure, the hinge member 104 is connected to a seatback 202 and the chassis 102 is generally higher than the hinge member 104. The headrest support assembly 100 has a cushion member 204 removably attached to the chassis 102 such that relative to a forward direction of the seatback 202, a profile of the cushion member 204 in the first position is substantially the same as a profile of the cushion member 204 in the second position.

[0032] Fig. 2B shows a perspective view 250 of the headrest support assembly 100 of Fig. 1 with the chassis 102 at a second position, according to an example embodiment. In this Figure, the chassis 102 is generally lower than the hinge member 104. As the profile of the cushion member 204 in the first position is substantially the same as the profile of the cushion member 204 in the second position, the headrest support assembly 100 may be used to rest the user's head as intended whether the chassis 102 is flipped up at the first position or down at the second position.

[0033] Fig. 3A shows a perspective view 300 of the headrest support assembly 100 with the first side plate 106a and the second plate 106b pivoted forward of the chassis 102 while Fig. 3B shows a perspective view 350 of the headrest support assembly 100 with the first side plate 106a and the second plate 106b pivoted aft of the chassis 102, according to an example embodiment. The first side plate 106a and the second side plate 106b in Fig. 3A are each pivotable along the respective side edge 110a, 110b of the chassis 102. The first and second side plates 106a, 106b can provide support to a user's head from sideways movement, for example, when the user is sleeping. The ability of the side plates 106a, 106b to rotate about the respective side edges 110a, 110b allows the side plates 106a, 106b for perform the support function in both the first position and the second position of the chassis. For example, in the state shown in Fig. 3A, the side plates 106a, 106b can support the head of the passenger while the chassis 102 is in the first position. Similarly, in the state shown in Fig. 3B, after the chassis 102 is pivoted to the second position, the side plates 106a, 106b can support the head of the passenger.

[0034] In an alternate embodiment shown in Fig. 3B, the first side plate 106a and the second side plate 106b are pivoted at a position such that the aft support surface 114a of the first side plate 106a and the second plate 106b faces the aft facing surface of the chassis 102. In other words, the forward support surfaces 112a, 112b of the first and second side plates 106a, 106b faces away from the forward facing surface of the chassis 102. It can be appreciated by the skilled person that the first side plate 106a may be pivotable independent of the second side plate 106b. For example, the first side plate 106a may pivot to the position as shown in Fig. 3A while the second side plate 106b may pivot to the position as shown in Fig. 1.

[0035] Fig. 4 shows a perspective cross-sectional view 400 of the headrest support assembly 100, according to an example embodiment. In the Figure, the headrest support assembly 100 is attached to the seatback 202 and the first side plate 106a pivoted in the position as shown in Fig. 1. A cushion member 402 is removably attached to the chassis 102 and the first and second side plates 106a, 106b. It can be appreciated that the cushion member 402 also covers the second side plate 106b even though only the first side plate 106a is shown. The cushion member 402 is attached such that, relative to the forward direction of the seatback 202, a profile of the cushion member 402 when the chassis 102 (together with the first and second side plates 106a, 106b) in the first position is substantially the same as a profile of the cushion member 402 when the chassis 102 (together with the first and second side plates 106a, 106b) in the second position. Therefore, the headrest support assembly 100 can be used to rest the user's head comfortably whether the chassis 102 is at the first position or the second position and whether the first and second side plates 106a, 106b are folded or extended (as shown in Fig. 1).

[0036] Figs. 5A to 5C show a perspective view 500 of the headrest support assembly 100 at various heights on a guide 502, according to an example embodiment. In the Figs, the headrest support assembly 100 is mounted to the seatback 202 and the hinge member 104 is slidable relative to the guide 502 extending along a height direction of the seatback 202. The guide 502 as shown in Figs. 5A to 5C includes a plurality of rods that are mounted to the seatback 202. The headrest support assembly 100 may be adjusted vertically by having the hinge member 104 slidably mounted onto the guide 502. In Fig. 5A, the hinge member 104 is at the lowest position of the guide 502. The chassis 102 is at the second position and the first and second side plates 106a 106b are folded. Such a

configuration may extend the reach of the headrest support assembly 100 beyond the limits of the guide 502. In Fig. 5B, the chassis 102 is pivoted to the first position while the first and second side plates 106a, 106b are maintained at the same position. The hinge member 104 then slides to the highest position of the guide 502 in Fig. 5C, thereby extending the reach of the headrest support assembly 100 beyond the limits of the guide 502.

[0037] Figs. 6A to 6C show a perspective view 600 of the headrest support assembly 100 at various heights on an alternate guide 602, according to an example embodiment. The guide 602 as shown in Figs. 6A to 6C includes one or more guide tracks that are mounted to the seatback 202. The headrest support assembly 100 may be adjusted vertically by having the hinge member 104 slidably mounted onto the plurality of guide tracks. In Fig. 6A, the hinge member 104 is at the highest position of the guide 602. The chassis 102 is at the first position and the first and second side plates 106a, 106b are extended. Such a configuration can extend the reach of the headrest support assembly 100 beyond the limits of the guide 602.

[0038] In Fig. 6B, the hinge member 104 slides to the lowest position of the guide 602. The chassis 102 is then pivoted to the second position in Fig. 6C while the first and second side plates 106a, 106b are maintained in the same position, thereby extending the reach of the headrest support assembly 100 beyond the limits of the guide 602. It can be appreciated that other forms of vertical sliding mechanisms may be used, such springs and bushings.

[0039] Fig. 7 shows a flowchart illustrating a method for manufacturing a headrest support assembly according to an example embodiment. The method comprises, at step 702, connecting a hinge member to a seatback. At step 704, the method includes pivotally mounting a chassis to the hinge member such that the chassis is pivotable between a first position in which the chassis is generally higher than the hinge member and a second position in which the chassis is generally lower than the hinge member.

[0040] Fig. 8 shows a flowchart illustrating a height adjustment method for a headrest support assembly, according to an example embodiment. At step 802, the method includes providing the headrest support assembly as described. At step 804, the method includes sliding the hinge member of the headrest support assembly

relative to a guide extending along a height direction of a seatback to a selected height. At step 806, the method includes pivoting the chassis of the headrest support assembly either the first position in which the chassis is generally higher than the hinge member or the second position in which the chassis is generally lower than the hinge member.

[0041] The headrest support assembly 100 as described herein may be used in any seating solutions for any mode of transportation, such as aircraft, motor vehicles, trains or sea craft. It may also be used in furniture for offices and homes. The headrest support assembly may double the travel distance of current headrests and the headrest's flaps (i.e. first plate and second side plates) may be used regardless whether the headrest support assembly is flipped up or down. The headrest support assembly may also extend beyond the track limits of a guide by increasing the vertical distance of current sliding mechanisms (or guide) and therefore not rely on the vertical range of the rails or tracks. The headrest support assembly may be cushioned on both sides so that the user may rest their head on the headrest support assembly with little discomfort even when the headrest support assembly is flipped up, down or over. While exemplary embodiments have been presented in the foregoing detailed description of the invention, it should be appreciated that a vast number of variations exist.

[0042] It should further be appreciated that the exemplary embodiments are only examples, and are not intended to limit the scope, applicability, operation, or configuration of the invention in any way. Rather, the foregoing detailed description will provide those skilled in the art with a convenient road map for implementing an exemplary embodiment of the invention, it being understood that various changes may be made in the function and arrangement of elements and method of operation described in an exemplary embodiment without departing from the scope of the invention as set forth in the appended claims.

[0043] It will be appreciated by a person skilled in the art that numerous variations and/or modifications may be made to the present invention as shown in the specific embodiments without departing from the spirit or scope of the invention as broadly described. The present embodiments are, therefore, to be considered in all respects to be illustrative and not restrictive.

CLAIMS

1. A headrest support assembly comprising:
a hinge member connected to a seatback; and
a chassis pivotably mounted to the hinge member;
wherein the chassis is pivotable between a first position in which the chassis is generally higher than the hinge member and a second position in which the chassis is generally lower than the hinge member.
2. The headrest support assembly as claimed in claim 1, wherein the chassis comprises a rectangular plate comprising two horizontal edges and two side edges, and wherein the chassis is pivotally mounted to the hinge member along a horizontal edge of the rectangular plate.
3. The headrest support assembly as claimed in claim 2, further comprising first and second side plates each pivotally mounted to the rectangular plate along a respective side edge of the rectangular plate.
4. The headrest support assembly as claimed in any one of the preceding claims, further comprising a cushion member removably attached to the chassis, wherein, relative to a forward direction of the seatback, a profile of the cushion member in the first position is substantially the same as a profile of the cushion member in the second position.
5. The headrest support assembly as claimed in any one of the preceding claims, wherein the hinge member is slidable relative to a guide extending along a height direction of the seatback.
6. A seatback comprising the headrest support assembly as claimed in any one of the preceding claims.
7. A method of manufacturing a headrest support assembly, the method comprising:
connecting a hinge member to a seatback; and
pivotally mounting a chassis to the hinge member such that the chassis is pivotable between a first position in which the chassis is generally higher than the

hinge member and a second position in which the chassis is generally lower than the hinge member.

8. The method as claimed in claim 7, wherein the chassis comprises a rectangular plate comprising two horizontal edges and two side edges, and wherein pivotally mounting the chassis to the hinge member comprises mounting along a horizontal edge of the rectangular plate.

9. The method as claimed in claim 8, further comprising pivotally mounting first and second side plates to the rectangular plate each along a respective side edge of the rectangular plate.

10. The method as claimed in any one of claims 7 to 9, further comprising removably attaching a cushion member to the chassis such that relative to a forward direction of the seatback, a profile of the cushion member in the first position is substantially the same as a profile of the cushion member in the second position.

11. The method as claimed in any one of claims 7 to 10, wherein connecting the hinge member to the seatback comprises connecting the hinge member to a guide extending along a height direction of the seatback such that the hinge member is slidable relative to the guide.

12. A height adjustment method for a headrest support assembly, the method comprising:

providing the headrest support assembly as claimed in claim 1;

sliding the hinge member of the headrest support assembly relative to a guide extending along a height direction of a seatback to a selected height; and

pivoting the chassis of the headrest support assembly either the first position in which the chassis is generally higher than the hinge member or the second position in which the chassis is generally lower than the hinge member.