

An Adjustable Support Device for a Seat

Background and Field of the Invention

5 The invention relates to an adjustable support device for a seat, more particularly but not exclusively, for supporting a user's back.

With people spending more and more time in sitting positions, for example air travels, driving or on buses, a number of support cushions and pillows have
10 been introduced to make it more comfortable and perhaps reduce fatigue. For example, there is an inflatable U-shape head/neck support which is placed around the neck and on the shoulders to help support the head/neck when the user is seated. Airlines are also known to provide rectangular cushions which may be placed behind the back of the user to somewhat provide some comfort
15 during the flights. However, existing products have limitations in the use and more often than not is unable to provide good supports for the user or occupant of the seat.

It is an object of the present invention to provide an adjustable support device
20 which alleviates at least one of the disadvantages of the prior art and/or to provide the public with a useful choice.

Summary of the Invention

25 In a first aspect of the present invention, there is provided an adjustable support device for a seat, comprising a support frame having a guide track; an attachment device arranged to be slidable along the guide track in response to a force, the guide track arranged to positively hold the attachment device at a selected position along the guide track when the force is removed, a support
30 cushion attached to the attachment device for supporting an occupant's back; the support cushion being rotatable relative to guide track.

The term "occupant's back" is used in a general sense to mean the back of a person including the occupant or person's head, neck, upper and lower torso, spinal area etc. It should be appreciated that this phrase is used in a non-limiting sense which means that the adjustable support device is suitable for supporting the occupant's back but it may also be used to support other parts of the body, depending on its application.

An advantage of the described embodiment is that the adjustable support device allows flexible adjustment of the position and orientation of the support cushion to suit the user's comfort and preference. Since the guide track positively holds or maintains the support cushion in position, this makes it more convenient for the user since a separate locking mechanism is not needed to hold the support cushion in place. Being portable, the adjustable support device may be carried by the user for use almost anywhere. Further, the adjustable support device provides multi-functions of supporting the neck, head, back of the body etc so the user can select how and where he needs the necessary support and adjust the support device accordingly. As a result, the support device may be regarded as "one type fits all".

The support frame may be arranged to be attached to a back rest of the seat. In the alternative, the support frame may form part of a cover for a cushion.

Preferably, the support cushion may include an engagement device having protrusions for engaging with the attachment device. The attachment device may also include elongate slots arranged to receive respective protrusions. Advantageously, the attachment device may include a rotatable disc movably mounted to a slidable member, and the elongate slots are disposed on the rotatable disc to enable the support cushion to rotate together with the rotatable disc.

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The slidable member may be mounted to the guide track. The engagement device may include projections arranged to engage with respective apertures of the rotatable disc.

In an embodiment, the support frame may include an elongate spine member, the guide track being attached to the elongate spine member, and a strap for fastening the support frame to a seat. The elongate spine member may include
5 at least one strap loop through which the strap passes through. The adjustable support device may further comprise a triangular buckle defining an opening, the triangular buckle including a first side fixedly attached to a first end of the strap and the opening enabling a second end of the strap to pass through. Advantageously, the adjustable support device may further comprise an
10 adjustable buckle for receiving the second end of the strap and for tightening the strap.

In a further embodiment, the support cushion may include a circular engagement device having a circular rim member defining an aperture for
15 engaging with the attachment device. In this case, the attachment device may include two opposing biasing arms arranged to engage with respective parts of the circular rim which causes the biasing arms to bias inwards and be received through the aperture for engagement with an internal part of the circular rim member. The attachment device may include a base portion arranged to
20 support the biasing arms and arranged to be attached to the guide track.

The base portion may include a channel arranged to receive part of a zip fastener, the base portion further including a through hole orthogonal to the channel, the through-hole being arranged to be coupled to slider elements of
25 the zip fastener.

Preferably, the guide track may include a zip fastener as proposed in the described embodiments. The support cushion may have a first support portion which is larger than a second support portion. The first support portion may
30 include a first bulbous portion and the second support portion may include a second bulbous portion.

It should be appreciated that the adjustable support device may be used in a variety of applications. For example, in a second aspect, there is provided an air, land or sea vehicle seat comprising an adjustable support device as discussed above. In further aspects, there is provided a sofa or a seat
5 comprising an adjustable support device as discussed above.

In a second aspect of the invention, there is provided an adjustable support device for a seat, comprising a guide track; an attachment device arranged to be slidable along the guide track in response to a force, the guide track
10 arranged to positively hold the attachment device at a selected position along the guide track when the force is removed, wherein the attachment device is arranged to be attached to a support cushion for supporting an occupant's back; the support cushion being rotatable relative to the guide track. The adjustable support device may be in the form of a cushion.

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It should be appreciated that features relevant to one aspect may also be relevant to the other aspects.

Brief Description of the Drawings

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Exemplary embodiments of the invention will now be described with reference to the accompanying drawings, in which:

Figure 1 is a perspective front view of an adjustable support device
25 having a support cushion according to a first embodiment of the invention;

Figure 2 is a perspective view of the adjustable support device of Figure 1 with the support cushion removed to show a guide track and an attachment device of the adjustable support device more clearly;

Figure 3 is a closed-up view of the attachment device of Figure 2 having
30 a rotatable disc and a slidable body;

Figure 4 shows the attachment device of Figure 3 with the rotatable disc separated from the slidable body;

Figure 5 is a rear perspective view of the support cushion of Figure 1 which includes an engagement device;

Figures 6 to 9 illustrate how the support cushion of the adjustable support device may be adjusted to suit the occupant's preference;

5 Figure 10 illustrates various exemplary uses of the adjustable support device of Figure 1;

Figures 11 to 13 illustrate a variation of the adjustable support device of Figure 1;

10 Figure 14 is a perspective view of an adjustable support device having a support cushion according to a second embodiment of the invention;

Figure 15 shows the adjustable support device of Figure 14 without the support cushion;

Figure 16 is a rear view of the adjustable support device of Figure 15;

15 Figure 17 is an enlarged view of portion B of Figure 16 to show a triangular buckle;

Figure 18 is an enlarged view of portion D of Figure 15 to show an adjustable roller buckle;

Figure 19 illustrates a variation of the adjustable support device of Figure 14; Figure 20 illustrates a variation of the adjustable roller buckle of Figure 18;

20 Figure 21 is a perspective view of an adjustable support device having a support cushion according to a third and preferred embodiment of the invention;

Figure 22 is a perspective view of the adjustable support device of Figure 21 without showing the support cushion to show an attachment device;

25 Figure 23 is an enlarged side view of the attachment device of Figure 22 together with a simplified side view of a zip fastener;

Figure 24 is a rear perspective view of the support cushion of Figure 21 showing a connector;

Figure 25 shows the rear perspective view of the support cushion of Figure 25 and how the connector attaches to the attachment device of Figure 23;

30 Figure 26 is an enlarged view of the attachment device being attached to the connector from an inside of the support cushion;

Figure 27 is a perspective view of the adjustable support device of Figure 21 showing a movement and orientation of the support cushion 800;

Figure 28 is a rear perspective view of the adjustable support device of Figure 27 and illustrating two fastening straps for fastening the support device to a seat;

Figure 29 is the rear perspective view of the adjustable support device of Figure 28 but with the two fastening straps being used in a different manner;

Figure 30 shows a buckle which forms part of the fastening straps of Figures 28 and 29; and

Figure 31 illustrates how the adjustable support device of Figure 21 is attached to a chair.

Detailed Description of Preferred Embodiment

Figure 1 shows an adjustable support device 100 according to a first embodiment of the invention. The adjustable support device 100 includes a support frame in the form of a flexible seat harness 102 adapted to conform generally to a back rest of a seat (not shown). The seat harness 102 is made of fabric and has a generally planar main portion 104 which extends into a narrower head rest portion 106. Area of the seat harness 102 is intended to cover most of the back rest of the seat and is defined by a bottom edge 108 of the main portion 104, side edges 110,112, curved edges 114,116 adjoining respective side edges 110,112 and a top edge 118 at the head rest portion 106.

The seat harness 102 further includes a number of straps or fasteners 120 attached to and spaced along the edges 108,110,112,114,116,118. The fasteners 108 are configured to strap the seat harness to the back rest of the seat. It should be appreciated that the fasteners 108 may be elastic to ensure a tight fit.

The adjustable support device 100 includes a guide track extending vertically (but may not be so) along the centre of the adjustable support device 100 from the head rest portion 106 to the main portion 104. In this embodiment, the guide track is in the form of a zip fastener 122 and specifically, a first end 124 of the zip fastener 122 is arranged near the top edge 118 and a second end 126 of the

zip fastener 122 is arranged near the bottom edge 108 and in this way, the zip fastener 122 almost extends the entire length (or height) of the seat harness 102 and a reason for this will be apparent later.

5 The adjustable support device 100 further includes a support cushion 130 movably attached to the zip fastener 122 via an attachment device 134. In Figure 2, the support cushion 130 is detached from the guide track 122 to show the attachment device 134 more clearly. Figure 3 is a closed-up view of the attachment device 134 which includes a slidable member 136 and a rotatable
10 disc 138 mounted to the slidable member 136. The attachment device 134 further includes a first slider 140 and a second slider 150 which are structurally similar. Each slider 140,150 has a slider body 142,152 for engaging the zipper fastener's teeth to join or separate the teeth depending on the movement of the sliders 140,150 similar to a conventional zipper. Each slider 140,150 includes
15 an engagement tab 144,154 mounted to the respective slider body 142,152 and which is attached to respective ends of the slidable member 136. In this way, the first and second sliders 140,150 support the slidable member 136 and when the first and second sliders 140,150 move in unison, the slidable member 136 is caused to slide along the zip fastener 122.

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The slidable member 136 has a circular frame 160 and an engagement flange 162 which cooperates with the circular frame 160 to define an engagement slot (not shown) for receiving engagement lugs 164 of the rotatable disc 138, and these parts are shown more clearly in Figure 4 with the rotatable disc 138
25 detached from the slidable member 136. Indeed, the rotatable disc 138 is detachable from and re-attachable to the slidable member 136. With the engagement lugs 164 of the rotatable disc 138 seated in the engagement slot of the slidable member 136, this enables the rotatable disc 138 to rotate relative to the slidable member 136.

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The rotatable disc 138 is circular and has a planar main portion 166 and a circumferential edge 168 which carries the engagement lugs 164 which are spaced along the circumferential edge 168. The rotatable disc 138 further

includes two elongate slots 170,172 spaced apart from each other and two circular apertures 174,176 arranged between the two elongate slots 170,172 and which are spaced from each other.

- 5 Figure 5 is a rear perspective view of the support cushion 130 of Figure 1 and an outer layer of the support cushion 130 may be made of fabric or leather. At a front (i.e. area which faces the occupant) of the support cushion 130, there is a first elongate bulbous portion 180 which joins a second elongate bulbous portion 182 at a valley portion 184; the second elongate bulbous portion 182
10 being smaller in size than the first elongate bulbous portion 180. This design creates a curved side contour (formed by the portions 180,184,182) as shown in Figure 5 and which also provides options for the occupant of a seat or user to choose which bulbous portion suits him.
- 15 The support cushion 130 has a support plate 186 which is made of hard plastic and is mounted to the rear of the support cushion 130. The support cushion 130 includes an engagement device 190 mounted to the support plate 186 and the engagement device 190 includes two opposing sets of protrusions 192,194 and two cylindrical projections 196,198 arranged between the two opposing sets of
20 protrusions 192,194.

Each protrusion 192,194 is generally L-shaped and has a engagement section (not shown) which is inserted into the respective elongate slots 170,172 (i.e. two protrusions 192 of the same set engage with one of the elongate slots 170 and
25 the other two protrusions 194 of the other set engage with the other elongate slot 172) until both "click" in place. When engaged, the two cylindrical projections 196,198 are also received in the respective circular apertures 174,176. In this way, the support cushion 130 is attached to and moves together with the attachment device 134 and is also rotatable with respect to the
30 zip fastener 122. The two cylindrical projections 196,198 is arranged to stabilize the support cushion 130 when a user leans or rest against the support cushion 130. This helps to prevent the support cushion 130 from being dislodged or detached from the attachment device 134 when the user shifts positions while

resting on the support cushion 130 and thus causing the support cushion 130 to move relative to the attachment device 134.

In use, the adjustable support device 100 is attached to the back rest of a seat (not shown) by using the seat harness 102 with the head rest portion 106 placed on a head rest of the seat. It is found that the seat harness should be taut longitudinally when the seat harness 102 hugs the back rest of the seat to ensure a smooth operation of the attachment device 134, in particular the sliding of the sliders 140,150. Depending on the height, size or preference of the occupant of the seat, the user/occupant may adjust the position and/or orientation of the support cushion 130 accordingly. For example, with reference to Figures 1 and 6, the support cushion 130 may be pushed up by the user to the head rest portion 106 and this pushing force thus causes the attachment device 134 and the sliders 140,150 to slide upwards to the head rest portion 106. When the pushing force of the user is released, the support cushion 130 is held positively in place at the head rest portion 106 due to the action of the zip fastener 122. This enables the user to leave the seat and yet ensures that the support cushion 130 is maintained or held in his preferred position and/or location, which may be to support the head or neck of the user. It should be appreciated that in Figure 6, the first elongate bulbous portion 180 of the support cushion 130 is above the second elongate bulbous portion 182.

Imagine that after the user sits for a while or when the user wishes to have a different level of support, the user may rotate the support cushion 130 relative to the zip fastener 122 or seat harness 102 as shown by an arrow A in Figure 7. The rotation of the support cushion 130 is enabled by the rotatable disc 134 rotating with respect to the slidable member 136 and due to interaction between the engagement device 190 and the elongate slots 170,172 or apertures 174,176. As shown in Figure 7, the support cushion 130 is caused to move downwards towards the bottom end 108 by moving the first and second sliders 140,150.

Figure 8 shows a result of further rotation of the support cushion 130 in the direction A and it should be appreciated that if the user wants, he may maintain the support cushion 130 in this position and orientation. Indeed, the rotatable disc 134 may maintain any orientation of the support cushion 130.

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Figure 9 shows the support cushion 130 being adjusted all the way down of the zip fastener 122 so that the support cushion 130 is closest to the bottom edge 108 and with the first elongate bulbous portion 180 of the support cushion 130 now below the second elongate bulbous portion 182. In this position, the support cushion 130 may be suitable for supporting the back or spine of the user. Similarly, the orientation of the support cushion 130 (i.e. whether the first elongate bulbous portion 182 is on top or below the second elongate bulbous portion 180 or side by side etc) may be adjusted by the user to suit his preference.

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It should be appreciated that the support cushion 130 may be moved to any where along the length of the zip fastener 122 and maintained positively in that position and this provides greater flexibility and convenience for the occupant or user of the seat.

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It would be apparent that the adjustable support device 100 may be used in many applications. For example, as shown in Figure 10, the adjustable support device 100 may be attached to car seats, office chairs or seats or rocking chairs. Also, the adjustable support device 100 may be attached to airplane seats, coach or bus seats, train seats etc. Since the adjustable support device 100 is portable, it is easy to be carried around by the user for use during travels.

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The described embodiment should not be construed as limitative. For example, the support cushion 130 may come in different shapes and sizes. Indeed, a possibility is to offer different designs for selection by the user since the support cushion 130 may be easily attached (or detached) from the attachment device 134. Instead of a zip fastener, other suitable forms of guide track may be used

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Further, the adjustable support device 100 is very flexible since it may also be used with a seat (or chair) with no head rest or a seat which has a low back support. This may be achieved by folding the head rest portion 106, the curved edges 114,116 or part of the main portion 104 downwards over the seat and the seat cushion 130 may still slide along the remaining portions of the zip fastener 122.

The support frame may take other forms and may not necessarily be the seat harness 102 for attaching to a seat. For example, the support frame may be or may form of a cushion cover 200 of a cushion 202 and the zip fastener 122 is directly sewn to the cushion cover 200 as shown in Figure 11. It should be appreciated that the support cushion 130 operates in a similar manner with the ability to adjust or slide along the length of the zip fastener 122 as shown in Figure 12 and to orientate its position relative to the zip fastener 122 accordingly. Indeed, this may mean that the support cushion 200 may be adjusted to a position which is on top of the cushion 202 and this is shown in Figure 13. It would be apparent that the cushion 202 may be placed on a sofa and the support cushion 130 adjusted to support the occupant of the sofa and to provide the desired support and comfort. Further, other suitable slidable attachment devices may be used.

To further illustrate the variations that are possible, Figure 14 is an adjustable support device 500 according to a second embodiment of the invention. The adjustable support device 500 includes a support frame in the form of an elongate spine member 502 and a flexible strap 504 for attaching to a seat (and in particular to a backrest of the seat or chair). The elongate spine member 502 is made of fabric to provide a required stiffness and includes a guide track in the form of a zip fastener 506 (similar to the zip fastener 122 of the first embodiment) which extends almost throughout the entire length of the elongate spine member 502.

The adjustable support device 500 further includes a support cushion 508 movably attached to the zip fastener 506 via an attachment device 510 which is

similar to the attachment device 134 of the first embodiment. In the second embodiment, the support cushion 508 includes a first elongate bulbous section 512 which joins a second elongate bulbous section 514 at a valley section 516. Similar to the first embodiment, the second elongate bulbous section 514 is smaller in size than the first elongate bulbous section 512 but unlike the first embodiment, a length of the second elongate bulbous section 514 is longer than a length of the first elongate bulbous section 512. In addition to the curved contour (formed by the “undulating” sections 512,514,516), the difference in length also provides options for the occupant of a seat or user to choose which orientation and position of the support cushion 508 he prefers.

Figure 15 shows the adjustable support device 500 of Figure 1 without the support cushion 508 to illustrate the attachment device 510. Due to the similarities of the attachment device 510 and the attachment device 134 of the first embodiment, it should be appreciated that no further explanation of the attachment device 510 of the second embodiment is necessary except to mention that the attachment/detachment of the support cushion 508 to the attachment device 510 and rotating of the support cushion 508 with respect to the zip fastener 506 is similar to the first embodiment.

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Figure 16 is a rear view of the adjustable support device 500 of Figure 15 which shows an arrangement of the flexible strap 504. The flexible strap 504 includes a free end 518 and a fixed end 520 fixedly attached to a first side 522a of a triangular buckle 522, and Figure 17 is an enlarged view of portion B of Figure 16 to show how the flexible strap 504 is looped through the triangular buckle 522.

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As shown in Figure 17, the elongate spine member 502 includes a first end 524 having a pair of strap loops 526 and through which the free end 518 of the flexible strap 504 passes (direction of arrow C) and the free end 518 then forms a loop (as defined by a width and shape of the backrest of the seat) and is inserted through an opening 522c of the triangular buckle 522 and engages a

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second side 522b of the triangular buckle 522 and the free end 518 travels (behind the seat) towards a second end 528 of the elongate spine member 502.

Figure 18 is an enlarged view of portion D of Figure 15 to show the second end 528 of the elongate spine member 502 more clearly. As it can be appreciated, the elongate spine member 502 includes an adjustable buckle 530 attached to the second end 528 and which enables the free end 518 of the flexible strap 504 to loop through the adjustable buckle 530 and when the free end 518 is pulled, the flexible strap 504 is tightened against the backrest of the seat. In this way, the support frame of the second embodiment which has a generally inverted T-shape provides a simpler alternative to the support frame of the first embodiment.

Just like the first embodiment, other variations to the second embodiment are envisaged. For example, the adjustable support device 500 may be adapted to be attached to the various types of seats or chairs as shown in Figure 10 or to be attached to a cushion 600 as shown in Figure 19. In this case, the spine member 502 and the flexible strap 504 are adapted to loop around the cushion 600 without a need for the triangular buckle 522. Similarly, the support cushion 508 may be rotatable relative to the zip fastener 506. It should also be appreciated that the zip fastener 506 may be directly incorporated into a cover for the cushion 600 or the spine member 502 may be omitted and the flexible strap 504 directly attached to the zip fastener 506.

Further, other types of buckles may be used and the triangular buckle 522 and the adjustable roller buckle 530 may be replaced accordingly. For example, Figure 20 illustrates an adjustable slip lock buckle 532 through which the free end 518 of the strap 504 is looped as an alternative to the adjustable roller buckle 530 of Figure 18. The adjustable slip lock buckle 532 extends beyond the spine member 502 which may add a further length to the spine member 502.

To even further illustrate the variations that are possible, Figure 21 is an adjustable support device 700 according to a third and preferred embodiment of the invention. The adjustable support device 700 is similar to the one illustrated in the first embodiment, and includes a support frame in the form of a flexible
5 seat cover 702 adapted to conform generally to a back rest of a seat (not shown). The seat cover 702 is made of fabric and has a generally planar main portion 704 and is suitable for covering most of the back rest of the seat. The seat cover 702 is generally rectangular with two long sides 706,708 and a top end 710 and a bottom end 712. The seat cover 702 has an inner layer (not
10 shown) made of soft and flexible material to provide a suitable support and comfort to the user.

The adjustable support device 700 includes a guide track extending vertically (but may not be so) along a centre of the seat cover 702 from the top end 710
15 to near the other short side 712 of the seat cover 702. Similar to the first embodiment, in this embodiment, the guide track is in the form of a zip fastener 714 and specifically, a first end 716 of the zip fastener 714 is arranged near or at the top end 710 and a second end 718 of the zip fastener 714 is arranged near the bottom end 712 and in this way, the zip fastener 714 almost extends
20 the entire length (or height) of the seat cover 702.

The adjustable support device 700 further includes a support cushion 800 movably attached to the zip fastener 714 via an attachment device 750. The support cushion 800 is similar to the one shown in the first embodiment. In
25 Figure 22, the support cushion 800 is detached from the zip fastener 714 to show the attachment device 750. Figure 23 is a closed-up side view of the attachment device 750 which includes two opposing spring-loaded arms 752,754. Each arm 752,754 has a slightly tapered engagement portion 756,758 to facilitate attaching the attachment device to the support cushion 800, as will
30 be explained later. When respective inward force acts on the arms 752,754, this retracts the arms 752,754 slightly into a housing 760, which also supports the arms 752,754, and when the force is removed, the arms 752,754 bias outwards again.

The housing 760 sits on a rounded base 762 having a longitudinal channel 764. Further, the rounded base 762 includes a through hole 766 which runs orthogonal to the longitudinal channel 764. In this embodiment, the zip fastener 714 has a double zipper configuration and as is known, such a zipper configuration includes a first zip slider 720 and an opposing second zip slider 722. Each zip slider 720,722 has a ring connector 724,726 which can be aligned such that the respective ring connectors 724,726 are in registration with each other, as shown in Figure 23.

To couple the first and second zip sliders 720,722 to the attachment device 750, the first and second zip sliders 720,724 are received in the longitudinal channel 764 of the attachment device 750 and the through hole 766 arranged to register with the aligned ring connectors 724,726, and a fastener (such as a screw) is inserted through the through hole 766 and ring connectors 724,726. In this way, any movement of the attachment device 750 along a length direction of the zip fastener 714 would cause a corresponding movement of the zip sliders 720,722.

Figure 24 illustrates a rear view of the support cushion 800 of the third embodiment. The support cushion 800 includes a connector 802 having a support plate 804 and a circular engagement member 806. The engagement member 806 includes a circular aperture 808 defined by an external engagement rim 806a and an internal engagement rim 806b (see Figure 26 for the internal engagement rim 806b). In this embodiment, the connector 802 is received within a pocket (not shown) which is resealable (eg. using a zip) so that it is possible to access to the connector 802 for example, to replace it or to disengage the support cushion 800 from the attachment device 750.

To engage the support cushion 800 to the zip fastener 714 via the attachment device 750, the support cushion 800 is brought close to the attachment device 750 as shown in Figure 25 (with some part of the support cushion cut away), and it should be appreciated that many details of the zip fastener 714 and the

seat cover 702 (as shown in Figure 22) are omitted. Total unbiased length of the arms 752,754 are slightly longer than the diameter of the aperture 808 of the connector 802 and the engagement portions 756,758 of the arms 752,754 are configured to engage with respective parts of the external engagement rim 806a. Further application of a force on the support cushion 800 (for example) causes the external engagement rim 806a to act on the respective engagement portions 756,758 which biases the two opposing arms 752,754 to retract slightly within the housing 760. This enables the two opposing arms 752, 754 to clear the external engagement rim 806a, until the opposing arms 752,754 protrudes beyond the internal engagement rim 806b. This then biases the opposing arms 752,754 outwardly to attach the attachment device 750 to the connector 802 of the support cushion 800. This arrangement is shown in Figure 26 which is an internal view of the attachment device 750 and the connector 802 from the inside of the support cushion 800. It should be appreciated that in the attached arrangement, the attachment device is rotatable relative to the connector 802 (and with the connector 802 attached to the support cushion 800, the support cushion 800 is also rotatable relative to the attachment device 750 and the zip fastener 714).

Figure 27 shows the support cushion 800 being adjusted from a position shown in of Figure 21 to another position along the zip fastener 714 and also with the support cushion 800 rotated relative to the zip fastener 714.

As it can be appreciated, it is possible to release the attachment device 750 from the connector 802, by depressing the two opposing arms 752,754 which is accessible via the resealable pocket as suggested earlier.

Referring to Figure 27, the adjustable support device 700 further includes three side strap connectors 728 attached to each long side 706,708 of the seat cover 702, and two top strap connectors 730 attached to the top end 710. Figure 28 shows a rear view of the adjustable support device 700 of Figure 27 to show the strap connectors 728,730 more clearly. In Figure 28, two fastening straps 732 are used to link to respective pairs of the side strap connectors 728 in a lateral

manner and this may be used to strap the adjustable support device 700 to a seat.

Figure 29 is also a rear view of the adjustable support device 700 of Figure 28 but with each of the two fastening straps 732 connected between one of the top strap connectors 730 and one of the side strap connectors 728 with both fastening straps 732 forming a crisscross pattern. It should be appreciated that more fastening straps may be provided and a combination of the methods illustrated in Figures 28 and 29 may be used.

In this embodiment, the fastening strap 732 includes a buckle 734 at one end and a free end at the other. The buckle 734 includes two rectangular link elements 736,738 with each link element 736,738 including a first side member 736a,738a and a second side member 736b,738b. The first side members 736a,738a are held together as shown in Figure 30, with the second side members 736b,738b allowed to open and be spaced from each other. The second side member 738b of the second rectangular link member 738 includes a kink 738c or curved protrusion which is used to engage with a portion of the strap 732 when the free end is looped through the link elements 736,738. The usage of such a buckle is well known and thus, no further explanation is needed here.

Figure 31 is a picture of a sample of the adjustable support device 700 of Figure 21 being fastened to an office chair. It should also be appreciated that the adjustable support device 700 may be used with a sofa or other types of seat/chair as shown in Figure 10. Also, the adjustable support device 700 may form a part of the cushion such as that for a sofa. Indeed, it is possible that the support frame form part of a cushion cover and the zip fastener 714 sewn directly to the cushion cover similar as that explained for the first embodiment. The attachment device 750 may then be attached to the zip fastener 714 as explained above and since the zip fastener 714 may be located on one side of the cushion, a user has an option of flipping over the cushion when the user does not wish to use the support cushion 800. However, when the user wishes

to use the support cushion 800, he need only flipped over the cushion to attach the support cushion 800 to the attachment device 750 as described above and the user may then adjust the position and orientation of the support cushion along the length of the seat cover 702 to his liking so that the support cushion
5 may be used to support the user's back.

It should be appreciated that the support frame described in the above embodiments should be taut longitudinally when the support frame is attached to a back rest of a seat to ensure a smooth operation of the attachment device.
10 Also, in the case of the third embodiment, the fastening straps 732 may go around the seat, or may also go around the front the flexible seat cover 702.

Having now fully described the invention, it should be apparent to one of ordinary skill in the art that many modifications can be made hereto without
15 departing from the scope as claimed.

CLAIMS

1. An adjustable support device for a seat, comprising
a support frame having a guide track;
5 an attachment device arranged to be slidable along the guide track in
response to a force, the guide track arranged to positively hold the
attachment device at a selected position along the guide track when the
force is removed,
a support cushion attached to the attachment device for supporting an
10 occupant's back; the support cushion being rotatable relative to the guide
track.
2. An adjustable support device according to claim 1, wherein the support
frame is arranged to be attached to a back rest of the seat.
- 15 3. An adjustable support device according to claim 1, wherein the support
frame forms part of a cover for a cushion.
4. An adjustable support device according to any preceding claim, wherein
20 the support cushion includes an engagement device having protrusions
for engaging with the attachment device.
5. An adjustable support device according to claim 4, wherein the
attachment device includes elongate slots arranged to receive respective
25 protrusions.
6. An adjustable support device according to claim 5, wherein the
attachment device includes a rotatable disc movably mounted to a
slidable member, the elongate slots being disposed on the rotatable disc
30 to enable the support cushion to rotate together with the rotatable disc.
7. An adjustable support device according to claim 6, wherein the slidable
member is mounted to the guide track.

8. An adjustable support device according to claim 6 or 7, wherein the engagement device includes projections arranged to engage with respective apertures of the rotatable disc.

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9. An adjustable support device according to any preceding claim, wherein the support frame includes an elongate spine member, the guide track being attached to the elongate spine member, and a strap for fastening the support frame to a seat.

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10. An adjustable support device according to claim 9 wherein the elongate spine member includes at least one strap loop through which the strap passes through.

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11. An adjustable support device according to claim 9 and 10, further comprising a triangular buckle defining an opening, the triangular buckle including a first side fixedly attached to a first end of the strap and the opening enabling a second end of the strap to pass through.

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12. An adjustable support device according to claim 11, further comprising an adjustable buckle for receiving the second end of the strap and for tightening the strap.

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13. An adjustable support device according to any of claims 1-3, wherein the support cushion includes a circular engagement device having a circular rim member defining an aperture for engaging with the attachment device.

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14. An adjustable support device according to claim 13, wherein the attachment device includes two opposing biasing arms arranged to engage with respective parts of the circular rim which causes the biasing

arms to bias inwards and be received through the aperture for engagement with an internal part of the circular rim member.

- 5 15. An adjustable support device according to claim 14, wherein the attachment device includes a base portion arranged to support the biasing arms and arranged to be attached to the guide track.
- 10 16. An adjustable support device according to claim 15, wherein the base portion includes a channel arranged to receive part of a zip fastener, the base portion further including a through hole orthogonal to the channel, the through-hole being arranged to be coupled to slider elements of the zip fastener.
- 15 17. An adjustable support device according to any of claims 1 to 16, wherein the guide track includes a zip fastener.
- 20 18. An adjustable support device according to any preceding claim, wherein the support cushion has a first support portion which is larger than a second support portion.
- 25 19. An adjustable support device according to claim 18, wherein the first support portion includes a first bulbous portion and the second support portion includes a second bulbous portion.
- 30 20. An adjustable support device according to claim 19, wherein the second bulbous portion is longer than the first bulbous portion.
21. An air, land or sea vehicle seat comprising an adjustable support device according to any preceding claim.
22. A sofa comprising an adjustable support device according to any of claims 1 to 20.

23. A seat comprising an adjustable support device according to any of claims 1 to 20.
24. An adjustable support device for a seat, comprising
5 a guide track;
an attachment device arranged to be slidable along the guide track in response to a force, the guide track arranged to positively hold the attachment device at a selected position along the guide track when the force is removed, wherein the attachment device is arranged to be
10 attached to a support cushion for supporting an occupant's back; the support cushion being rotatable relative to the guide track.
25. An adjustable support device according to claim 24, in the form of a cushion.