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(19) **United States**(12) **Patent Application Publication**
Biaud(10) **Pub. No.: US 2005/0077765 A1**(43) **Pub. Date: Apr. 14, 2005**(54) **CHILD CAR SEAT INCLINING AND
SWIVELLING BETWEEN A TRAVELLING
POSITION AND AN INSTALLING POSITION****Publication Classification**(51) **Int. Cl.⁷ A47C 1/08**(52) **U.S. Cl. 297/256.16**(75) **Inventor: Richard M. Biaud, Tremontines (FR)**

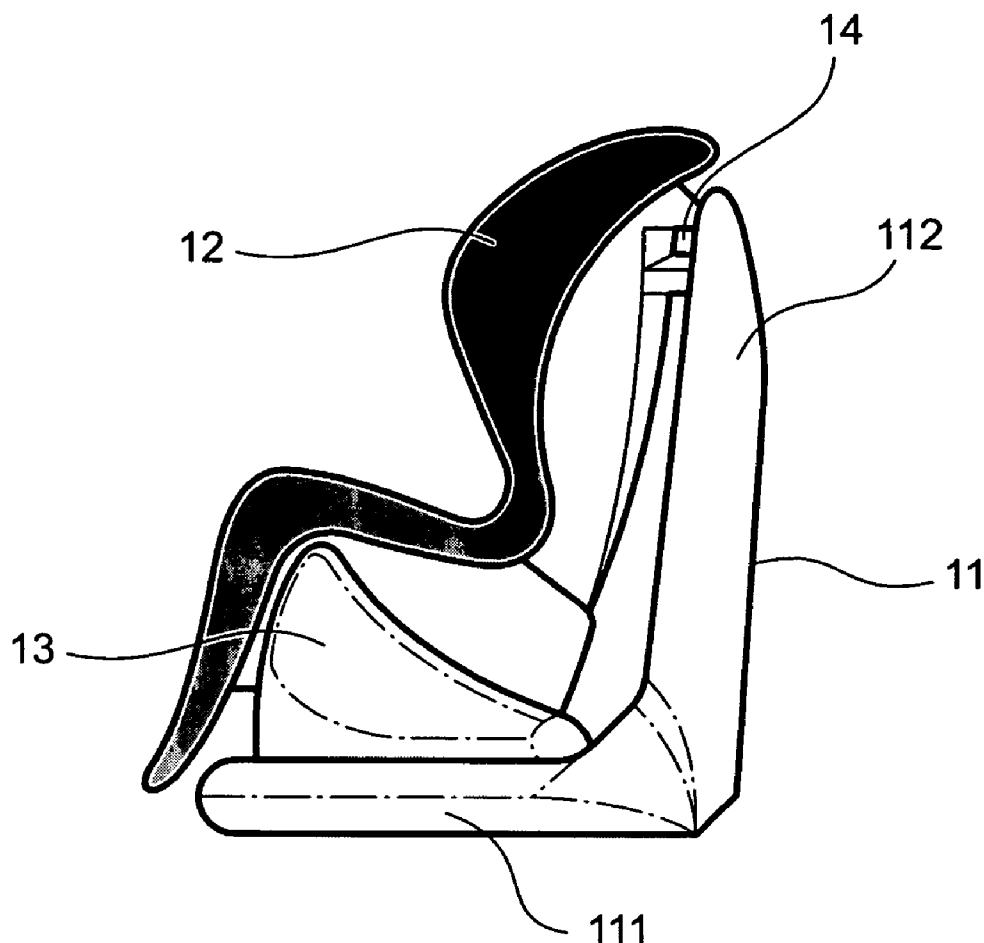
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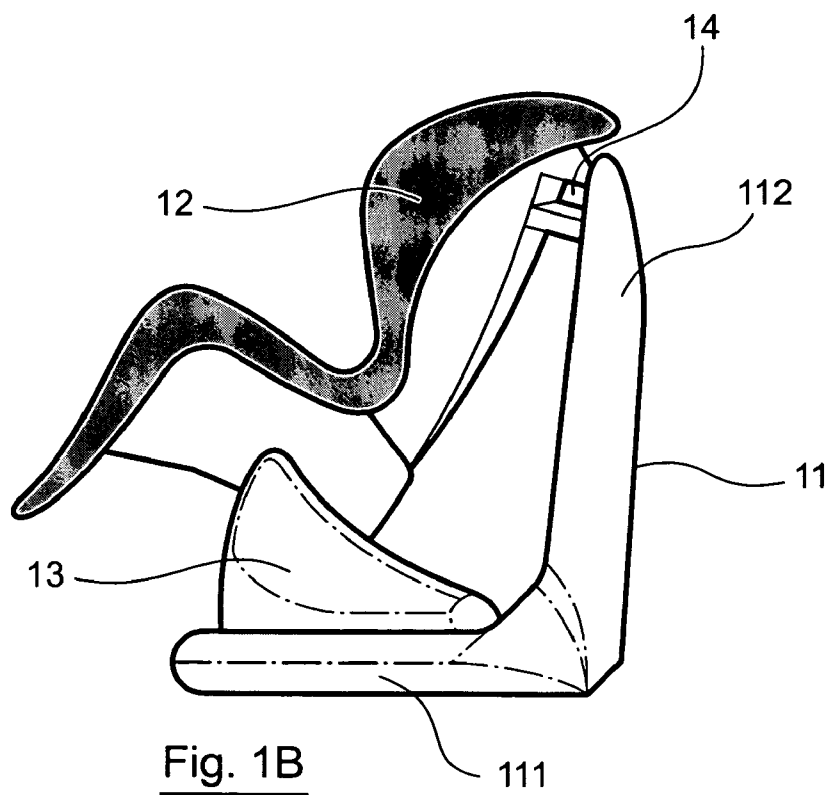
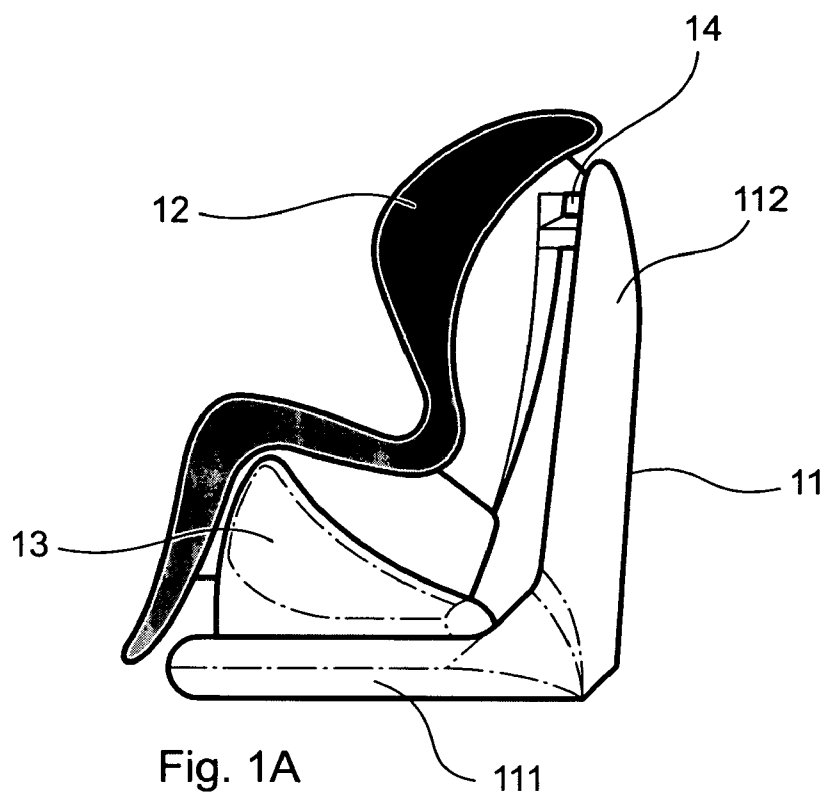
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(57) **ABSTRACT**

A child car seat device is provided, which includes a base intended to be fitted to a car seat and designed to accept a seat. The seat is movable in rotation in a substantially horizontal plane, so as to allow movement from a travelling position, in which said seat is orientated according to the principal axis of said vehicle, to a position for installing a child, in which said seat is turned substantially facing a door of said vehicle. The seat is also movable in inclination. The base has a part extending substantially vertically so as to lean against the backrest of said car seat, and whose upper part has a connection zone with the upper part of the backrest of said seat. In said travelling position, said inclination is obtained essentially by rotating said seat in a substantially vertical plane about a fixed point belonging, in said travelling position, to said connection zone.





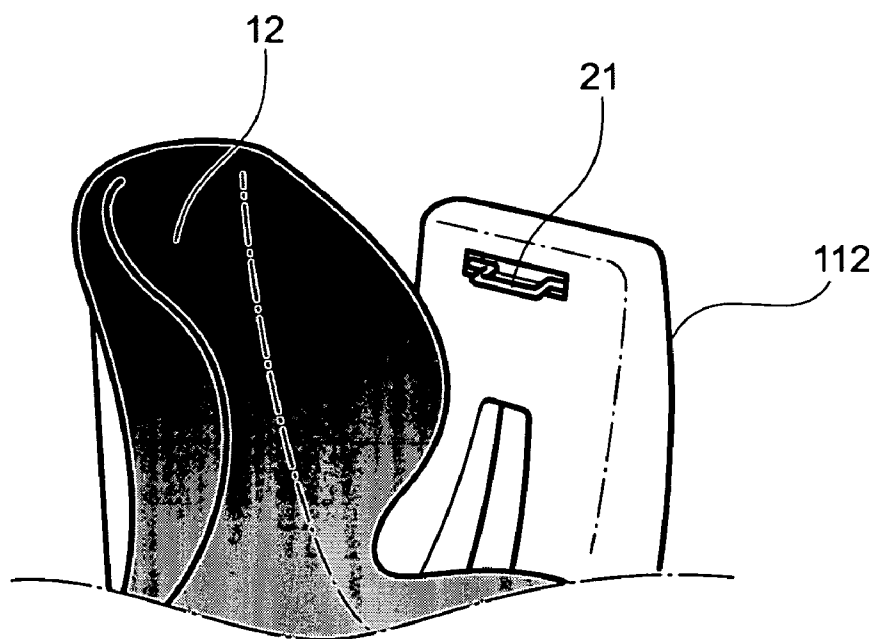


Fig. 2

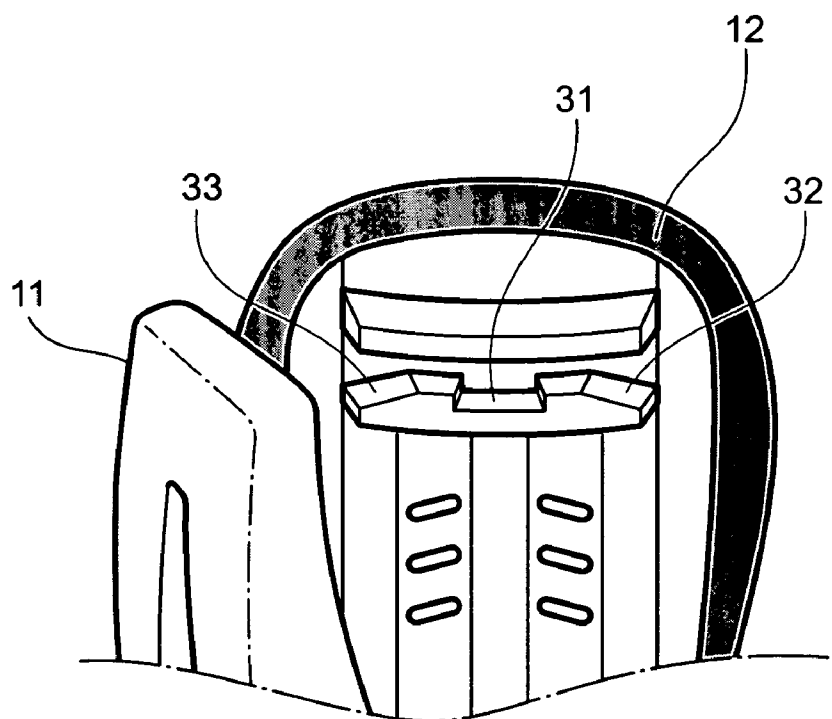
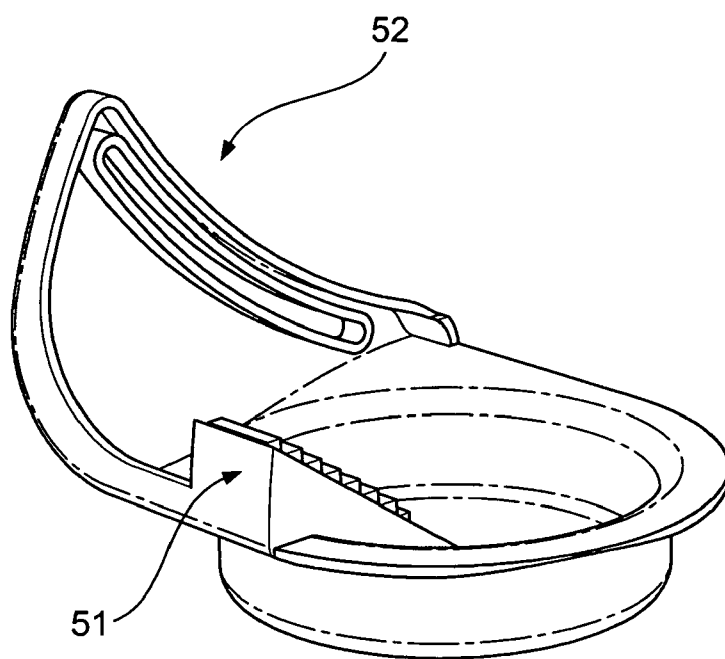
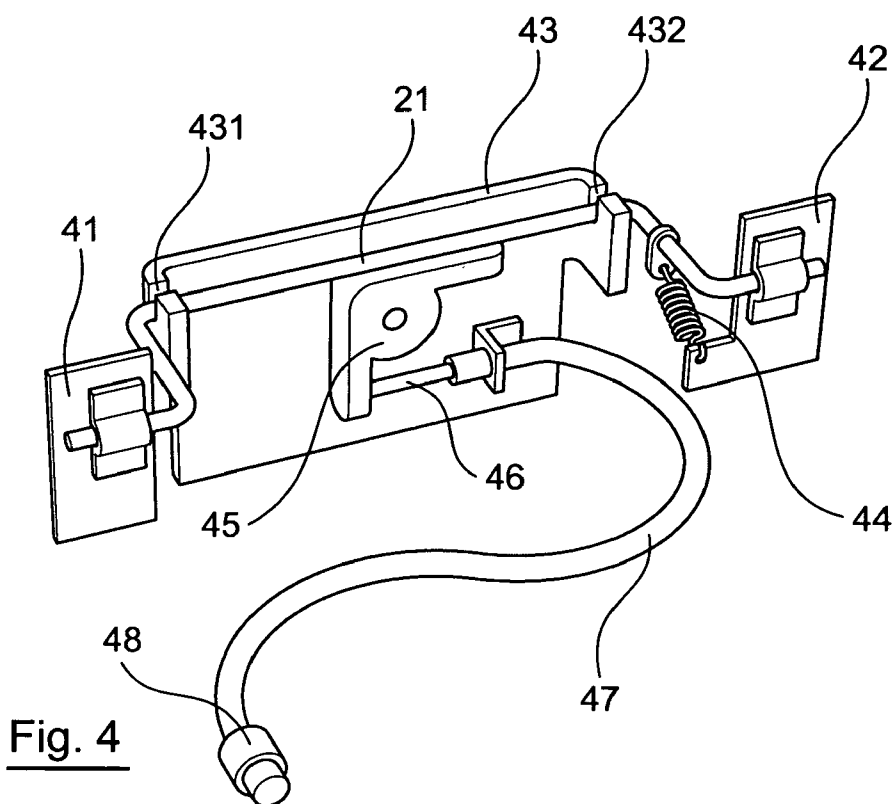


Fig. 3



CHILD CAR SEAT INCLINING AND SWIVELLING BETWEEN A TRAVELLING POSITION AND AN INSTALLING POSITION

CROSS-REFERENCE TO RELATED APPLICATION

[0001] Cross-reference is hereby made to U.S. application Ser. No. 10/_____, having attorney docket number A71.12-0008, filed Aug. 13, 2004, which is entitled "CHILD CAR SEAT SWIVELLING BETWEEN A FORWARD FACING POSITION AND A DOOR FACING POSITION, WITH AUTOMATIC RETURN TO FORWARD FACING POSITION," and which is hereby incorporated by reference.

FIELD OF THE INVENTION

[0002] The invention relates to the field of child care. More precisely, the invention relates to child seats intended to be fitted in a vehicle. Even more precisely, the invention relates to movable car seats so that they have an installing position (facing the door) and a travelling position (facing forwards).

BACKGROUND OF THE INVENTION

[0003] As regards car seats, one of the difficulties is accessibility, notably due to the limited space left by the door and the seat of the vehicle. It is generally rather difficult to install a child into the seat or to lift him out of it.

[0004] So as to facilitate installing the child, it was thus proposed to make the seat swivel in relation to a base or a fixed structure, the seat being likely to be moved between two positions:

[0005] a position for installing the child, facing the side door (there are generally two installing positions, the seat being able to turn either right or left); and

[0006] a forward facing transporting or travelling position.

[0007] The invention particularly relates to this type of child seat.

[0008] For safety reasons, it is desirable that the base holds the seat in at least two positions, on the lower section (seating part) and on the upper section (near the upper section of the backrest). For this reason the base has two substantially perpendicular sections, one leaning on the seat of the vehicle, and supporting the seating part of the child car seat, and another extending substantially vertically, along the backrest of the seat of the vehicle. The latter section comprises in its upper part means of connection with the upper part of the backrest of the child seat.

[0009] This double bonding naturally reinforces the safety, notably in the event of an impact. However, it engenders some difficulties, notably as regards the adjusting of the position of the seat in respect to the base.

[0010] Indeed it is desirable, for the comfort of the child, to be able to adjust the inclination of the seat. It was thus proposed to make the seat slide in relation to the base. This solution is efficient when the base only operates in conjunction with the seating part of the seat.

[0011] On the other hand, it can not be implemented in the above case where the upper part of the backrest is also connected to the base. Indeed, the backrest also moves, when the entire body rotates, whereas the base remains fixed. It is therefore difficult to connect them in an efficient manner.

[0012] Solutions have however been envisaged, with the help of sliding systems also planned on the upper part of the backrest and/or the seating part. But these solutions have an inconvenience, over and above their complexity. Indeed, it is necessary to bring the seat into a pre-set inclining position, classically fully raised, before being able to move the seat so as to alter it from the travelling position to the installing position.

[0013] This is quite impractical, as, each time the child is installed or lifted out, the seat must be put upright, then moved towards the door, then returned to the travelling position and finally put into the desired inclining position. This series of operations runs the risk of sparse use, in which the seat will always be in the upright position.

[0014] Furthermore, in the event where an intermediary position is appreciated by the child, it must be searched from among all the possible positions each time the seat is put back into the travelling position.

[0015] Another inconvenience of known techniques is that the adjusting of the inclination can only take place when the seat is in the forward facing position whereas it would often be easier to do whilst installing the child into his seat.

SUMMARY OF THE INVENTION

[0016] The purpose of the invention is notably to overcome these inconveniences of the prior art.

[0017] More precisely, a purpose of the invention is to provide a child car seat, that swivels between a travelling position and an installing position, irrespective of its position of inclination.

[0018] Another purpose of the invention is to provide such a child car seat, whose inclination can be adjusted in both the travelling position and in the installing position.

[0019] Another purpose of the invention is to provide such a child car seat, that is simple and inexpensive to manufacture, and that wears well.

[0020] Thus, a purpose of the invention is to provide such a child car seat that is relatively inexpensive, in particular as regards the number of parts and assembly time.

[0021] Yet another purpose of the invention is to provide such a child car seat, with good safety characteristics, and notably whose seat is retained by the upper part of its backrest.

[0022] The invention also has the purpose of providing such a child car seat, that is simple and ergonomic to maneuver and adjust, and comfortable for the child.

[0023] These purposes as well as others which will become clearer later on are reached with the help of a child car seat device comprising a base intended to be fitted to a car seat and designed to accept a seat, said seat being movable:

[0024] in rotation in a substantially horizontal plane, so as to allow the movement from a travelling position, in which said seat is orientated according to the principal axis of said vehicle, to a position for installing a child, in which said seat is turned substantially facing a door of said vehicle; and

[0025] in inclination.

[0026] According to the invention, said base has a part extending substantially vertically so as to lean against the backrest of said car seat, and whose upper part has a connection zone with the upper part of the backrest of said seat, in said travelling position, said inclination being obtained essentially by rotating said seat in a substantially vertical plane about a fixed point belonging, in said travelling position, to said connection zone.

[0027] Thus, the adjusting of the inclination does not interact, or barely, with the connection zone. It is thus possible to actuate the latter (to connect the seat in the travelling position, or to positively disconnect the seat from the upper part of the base so as to bring it into the installing position) irrespective of the position of inclination.

[0028] Likewise, it is possible to rotate the seat in all the positions of inclination, and to adjust the inclination even when the seat is in the installing position.

[0029] This is notably possible due to the fact that the inclination is obtained at least essentially via rotation, and that the axis of rotation lies in the connection zone, so that the latter remains in a substantially invariant position.

[0030] According to an advantageous embodiment, said seat is assembled on a single plate, itself ensuring both the mobility in rotation and inclination.

[0031] Said plate then advantageously bears at least one guiding zone substantially defining an arc of circle, collaborating with a complementary guiding element connected to said seat.

[0032] Preferably, said support plate bears at least a rack, defining at least two pre-set positions of inclination of said seat.

[0033] According to another advantageous aspect of the invention, said connection zone of said base bears at least a locking element collaborating with at least an anchorage element assembled on said backrest of the seat, when the latter is in said travelling position.

[0034] In an alternative manner, we can also plan that said backrest of the seat bears at least a locking element collaborating with at least an anchorage element assembled on said connection zone of said base, when said seat is in said travelling position.

[0035] According to a preferred embodiment, said anchorage element(s) comprise at least a rod, and in that said locking element(s) comprise at least a housing and/or at least a catching hook of said cable(s).

[0036] Advantageously, said anchorage element(s) are connected to return means with the tendency of returning them to the locking position.

[0037] Preferably, the element, base or backrest of the seat, bearing the anchorage element(s) comprises means for

guiding acting on said anchorage element(s) when said seat moves from the installing position to the travelling position, and/or vice versa.

[0038] Said means for guiding can advantageously act on said anchorage element(s) by opposing the restoring force of said return means, until bringing said anchorage element(s) into contact with said means for locking.

[0039] Preferably, said means for guiding have a width sufficient to collaborate with said anchorage element(s) irrespective of the inclination of said seat.

[0040] According to another advantageous characteristic of the invention, the device comprises means for unlocking, allowing to positively disconnect said anchorage element(s) from said locking element(s), then to move the seat from said travelling position to said installing position.

[0041] Notably, said means for locking advantageously comprise at least a cam acting on said anchorage element(s) so as to disengage them from said locking element(s).

[0042] Preferably, said means for unlocking are controlled in an off-set manner, by means of a control cable. Advantageously, said means for unlocking are controlled by one or other of the two control elements, respectively fitted on each of the sides of said seat or of said base.

[0043] The invention also relates to child seats equipping devices such as described above, and the corresponding bases.

[0044] Other characteristics and advantages of the invention will become clearer upon reading the following description of a preferable embodiment, given by way of non-restrictive example and made in reference to the annexed drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0045] FIG. 1A illustrates a child car seat according to one embodiment of the invention, in a travelling position, and in a seat upright position of inclination.

[0046] FIG. 1B illustrates the child car seat shown in FIG. 1A in the travelling position, and in a seat fully inclined position of inclination.

[0047] FIG. 2 illustrates the upper part of the base and of the seat in FIGS. 1A and 1B, when the seat is in an installing position.

[0048] FIG. 3 is a partial view of the back of the seat corresponding to a rear view of FIG. 2.

[0049] FIG. 4 illustrates a means of locking fitted on the seat and the base of the preceding figures.

[0050] FIG. 5 is a partial view of the swivel plate bearing the seating part.

DETAILED DESCRIPTION OF ILLUSTRATIVE EMBODIMENTS

[0051] An embodiment of the invention relates to a child car seat adjustable in inclination, and swivelling, so that it can be moved facing the door of a vehicle, so as to allow the installing and lifting out of a child. According to the invention, this inclination is ensured via a rotational movement (or practically rotational, a slight offsetting being acceptable),

the axis of rotation being located in a connection zone of the backrest of the seat with the upper part of its base.

[0052] Thus, this connection zone, and more precisely the locking elements that it contains, barely move and can therefore be activated and employed in all the positions of inclination. As this becomes clearer in the following, specific means are planned to allow the moving of the seat from the travelling position to the installing position, and vice versa, as also disclosed in U.S. application Ser. No. 10/_____, having attorney docket number A71.12-0008, filed Aug. 13, 2004, which is entitled "CHILD CAR SEAT SWIVELLING BETWEEN A FORWARD FACING POSITION AND A DOOR FACING POSITION, WITH AUTOMATIC RETURN TO FORWARD FACING POSITION," and which is hereby incorporated by reference.

[0053] We note that until now we have indiscriminately used the term seat for the entire body, or device, constituted of the base and the seat, or to designate the seat itself. From now on the term "seat" will designate the movable part compared to the base.

[0054] FIGS. 1A and 1B illustrate such a device according to the invention. The base 11 comprises a substantially horizontal part 111, leaning against the seating part of the car seat, and a substantially vertical part 112, leaning against the backrest of this car seat. The seat 12 is assembled on the base 11, through the use of a swivel plate 13.

[0055] In its upper part, the seat 12 comprises means for connection 14, collaborating with complementary elements designed for this purpose on the upper part of the base 112.

[0056] As previously indicated, the seat 12 can have several positions of inclination and at least one upright position (FIG. 1A) and a greatly inclined position (FIG. 1B). Preferably, several intermediary positions of inclination will be envisaged and indexed on the swivel plate 13.

[0057] This rotation is made about an axis extending around the means of connection 14, making the position of the latter rest substantially invariant.

[0058] Thus, it is possible to connect and disconnect these elements 14, so as to return the seat to the installing position, irrespective of the position of inclination of the seat.

[0059] FIGS. 2 and 3 illustrate this position of inclination, respectively seen from the front and from the rear.

[0060] As we note in FIG. 2, the base comprises means for anchoring 21, detailed in FIG. 4. The backrest 12 of the seat comprises, as illustrated in FIG. 3, means 31 designed to collaborate with the catching hook 21, and means for guiding this catching hook 32 and 33, designed to return, or guide, the latter into the anchorage position when the seat is brought from the installing position to the travelling position, irrespective of the inclination of the latter.

[0061] These elements are more precisely illustrated in FIG. 4.

[0062] The catching hook 21 (or rod) is connected to the base through the use of two plates 41 and 42. It is assembled in such a way so to be rotational, so as to hook on to or release it from a locking part 43, connected to the seating part.

[0063] In the illustrated embodiment, this part 43 comprises two slots 431 and 432, into which the rod 21 is inserted.

[0064] Of course, a similar locking system with a single central slot, or with several spindles each collaborating with a slot are conceivable. More generally speaking, a number of other locking systems can be envisaged as replacements or in addition.

[0065] A return spring 44 is fitted to the rod 21. This return spring 44 tries to return the rod 21 into the slots 431 and 432, so that the default position of the rod is the locked position. Another spring can be fitted to the other side of the rod.

[0066] In order to perform unlocking, so as to move the seat from the travelling position to the installing position, the rod 21 must be released from the slots 431 and 432. This can for example be obtained through the use of a cam 45 assembled under the rod 21, and advantageously operated remotely, via a system of cables 46.

[0067] This cable 46 can be assembled in a sheath 47, and have its other end connected to a push button 48, fitted for example to one of the armrests of the seat. Preferably, two such systems are envisaged, respectively on each armrest.

[0068] When the cable 46 is pulled, through the use of the push button 48, the cam 45 is tilted, which then pushes the rod 21 free from the slots 431 and 432. The seat can then be rotated.

[0069] Other actuating elements can also be envisaged.

[0070] Moreover, other means for locking can be envisaged, so as to render the entire body secure. We can thus for example plan for a part extending over the rod 21 to prevent it from disengaging in an untimely manner from the two slots 431 and 432.

[0071] We can also replace the slots 431 and 432, or at least one of them, with a locking element, bearing a catching hook or a jaw retaining the rod 21. The opening, or the releasing, of this locking element can replace the cam so as to allow the moving into the installing position, for example with a similar cable mechanism.

[0072] When the seat 12 is returned from the installing position to the travelling position, the upper part of the backrest comes into contact with the rod 21 (moved downwards by means of the return spring 44), by means of the section 32 or 33, which has an inclined part, and then progressively raises this rod (by opposing the restoring force of the spring).

[0073] When the seat is returned to the exact travelling position, the rod 21 automatically moves (still under the effect of the return spring 44) into the slots 431 and 432. The seat is thus automatically locked without the need for any manipulation. We thus have a simple, safe and efficient system.

[0074] We note that the rod can also be assembled on the seat, and the means for locking on the base.

[0075] FIG. 5 represents a partial view of the swivel plate of the seat previously described. This plate comprises a rack 51, allowing to index a series of positions of inclination of the seat in relation to the base. The plate also comprises, on each side of the rack, two guiding elements 52 (only one

being represented so as to make the rack **51** visible) defining an inclination ramp in an arc of circle, in which a complementary guiding element assembled to the seat can be slid.

[0076] Means for locking and unlocking the inclination (non-represented) are envisaged. They can for example classically act on the rack **51**.

[0077] We note that with such a system, it is possible to adjust the inclination of the seat when it is in either the travelling position or in the installing position. Indeed, only the elements illustrated in **FIG. 5** act upon this inclination.

[0078] The adjusting of the inclination whilst in the installing position does not affect the locking, when the seat is returned to the travelling position, as the rotation is done about an axis substantially coinciding with the connection zone. We note that the catching sections **32** and **33** of the rod **21** can also be used to compensate for a slight movement due to the adjusting of the inclination.

What is claimed is:

1. A child car seat device comprising a base intended to be fitted to a car seat and designed to accept a seat, said seat being movable in rotation in a substantially horizontal plane, so as to allow movement from a travelling position, in which said seat is orientated according to a principal axis of a vehicle in which the car seat device is installed, to a position for installing a child, in which said seat is turned substantially facing a door of said vehicle and said seat being movable in inclination, wherein said base comprises a part extending substantially vertically so as to lean against the backrest of said car seat, and whose upper part has a connection zone with the upper part of the backrest of said seat, in said travelling position, wherein said inclination is obtained essentially by rotating said seat in a substantially vertical plane, about a fixed point belonging, in said travelling position, to said connection zone.

2. The device according to claim 1, wherein said seat is assembled on a single plate, which ensures both the mobility in rotation and inclination.

3. The device according to claim 2, wherein said plate comprises at least one guiding zone substantially defining an arc of a circle, collaborating with a complementary guiding element connected to said seat.

4. The device according to claim 2, wherein said plate bears at least a rack, defining at least two pre-set positions of inclination of said seat.

5. The device according to claim 1, wherein said connection zone comprises at least one locking element assembled on said base or said backrest, which collaborates with at least one anchorage element assembled on the other of said base or said backrest, when said backrest is in said travelling position.

6. The device according to claim 5, wherein said anchorage element comprises at least a rod and said locking element comprises at least a housing and/or at least a catching hook of said rod.

7. The device according to claim 5, wherein said anchorage element is connected to return means with the tendency of returning the anchorage element to a locking position.

8. The device according to claim 7 wherein the locking element comprises means for guiding the anchorage element on said locking element when said seat moves from the installing position to the travelling position, and/or vice versa.

9. The device according to claim 8, wherein said means for guiding act on said anchorage element by opposing a restoring force of said return means, until bringing said anchorage element into contact with said locking element.

10. The device according to claim 8, wherein said means for guiding have a width sufficient to collaborate with said anchorage element irrespective of the inclination of said seat.

11. The device according to claim 5 and further comprising means for unlocking, allowing to positively disconnect said locking element from said anchorage element, then to move the seat from said travelling position to said installing position.

12. The device according to claim 11, wherein said means for unlocking comprise at least a cam acting on said anchorage element so as to disengage the anchorage element from said locking element.

13. The device according to claim 11, wherein said means for unlocking are controlled in an off-set manner, by means of a control cable.

14. The device according to claim 13, wherein said means for unlocking are controlled by one or other of two control elements, respectively fitted on each of the sides of said seat or of said base.

15. Child seat equipping the device according to claim 1.

16. Base for device according to claim 1.

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