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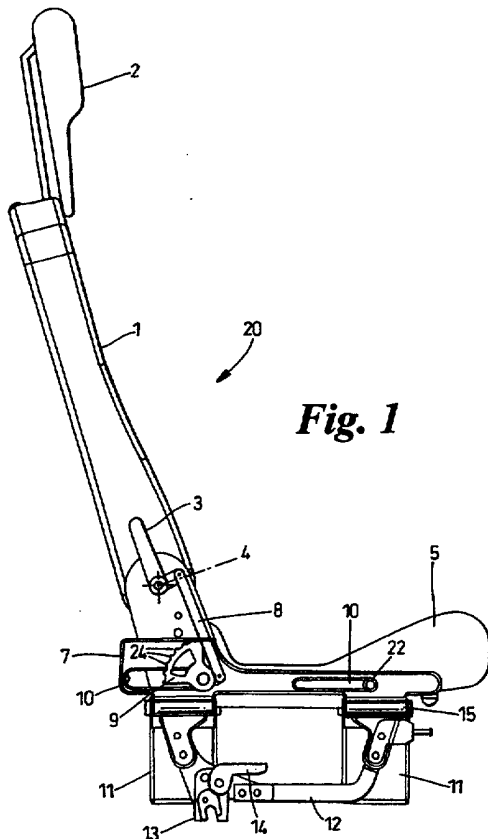
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(56) Documents Cited  
**GB 2336301 A**      **GB 2122674 A**      **WO 96/17743 A**  
**US 5489141 A**

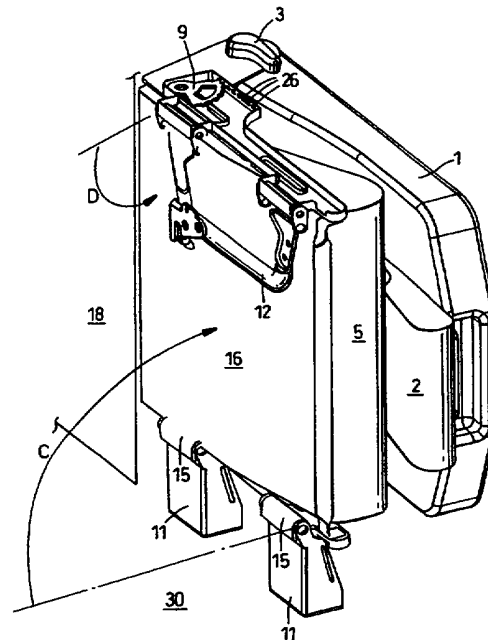
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UK CL (Edition R ) **A4L LAAR LAL LBPB LBPC LBPE**  
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(54) Abstract Title  
**Stowable vehicle seat assembly**

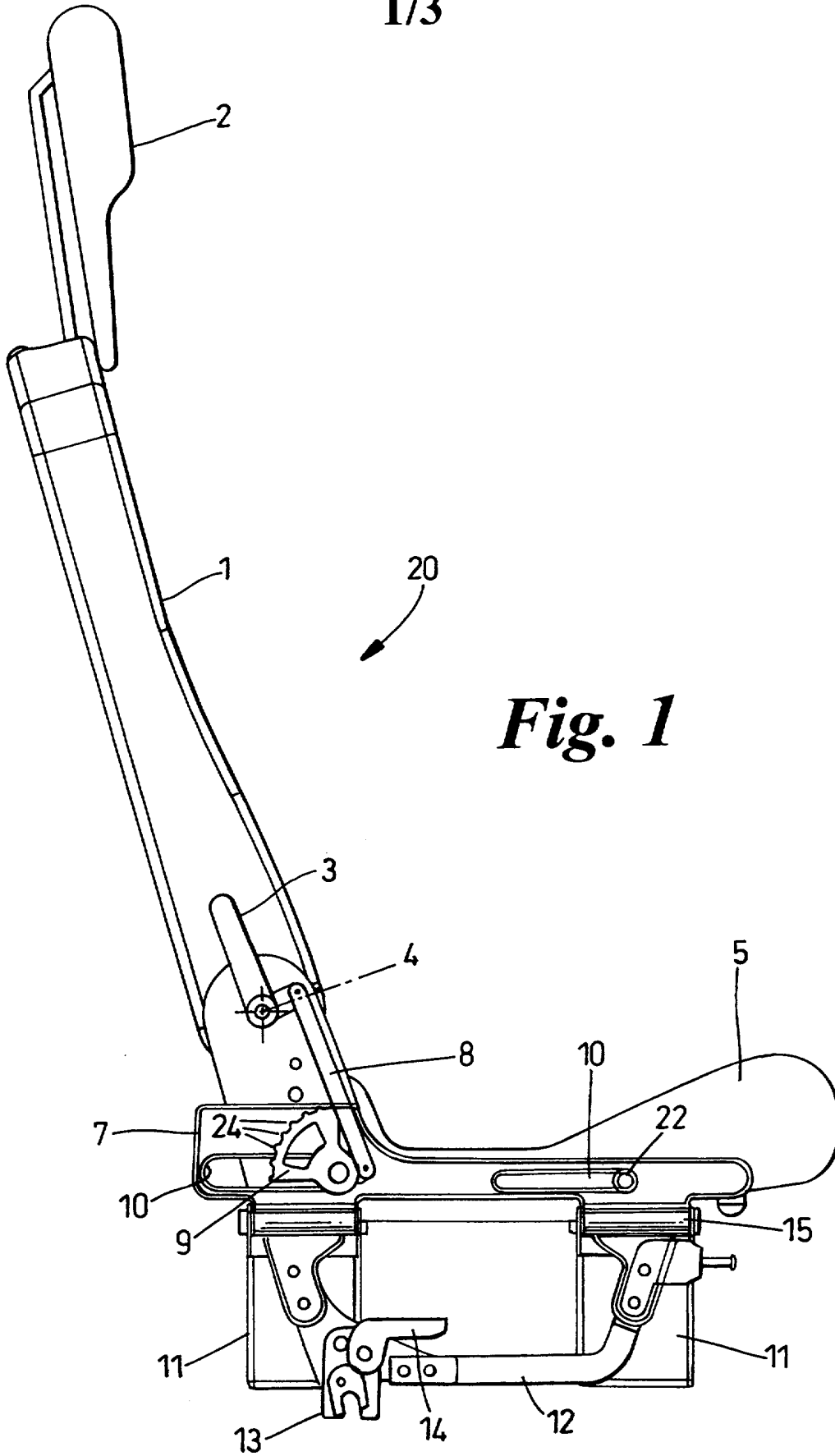
(57) A seat assembly is disclosed, in which as the backrest 1 is folded forwards, a linkage 8 causes a toothed element 9 to react against a carrier 7 on which a seat cushion 5 is adapted for movement. This causes the cushion 5 to move along the carrier 7 to the rear of the deployed position. The seat assembly is then pivoted about one side of the carrier 7 to a stowage position. The combined folding and sliding movement of the seat assembly in response to a single movement of a user, i.e. folding, is advantageous.



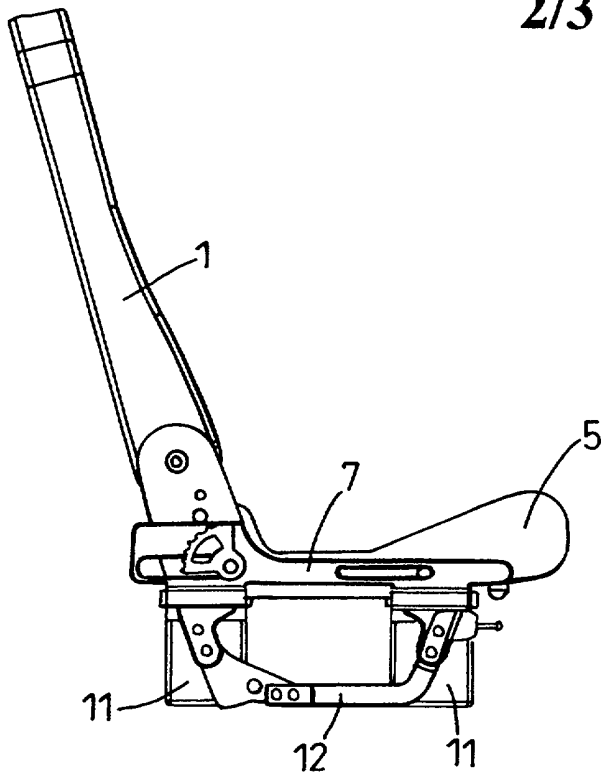
**Fig. 1**



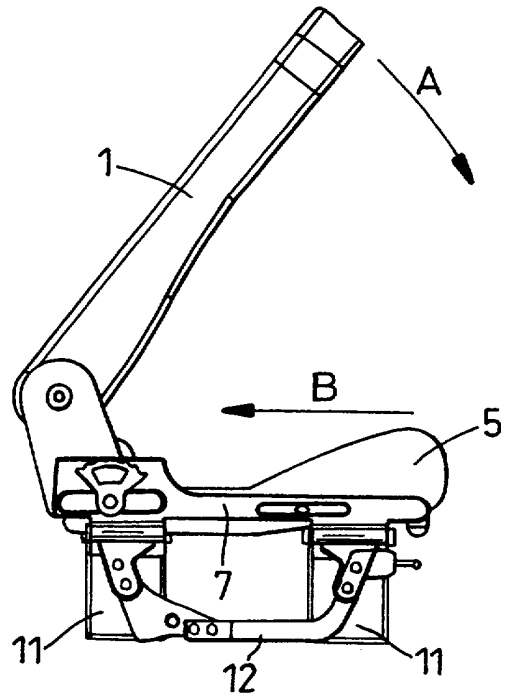
**Fig. 5**



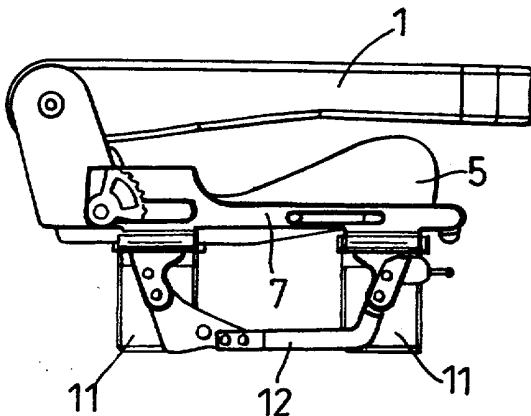
*Fig. 1*



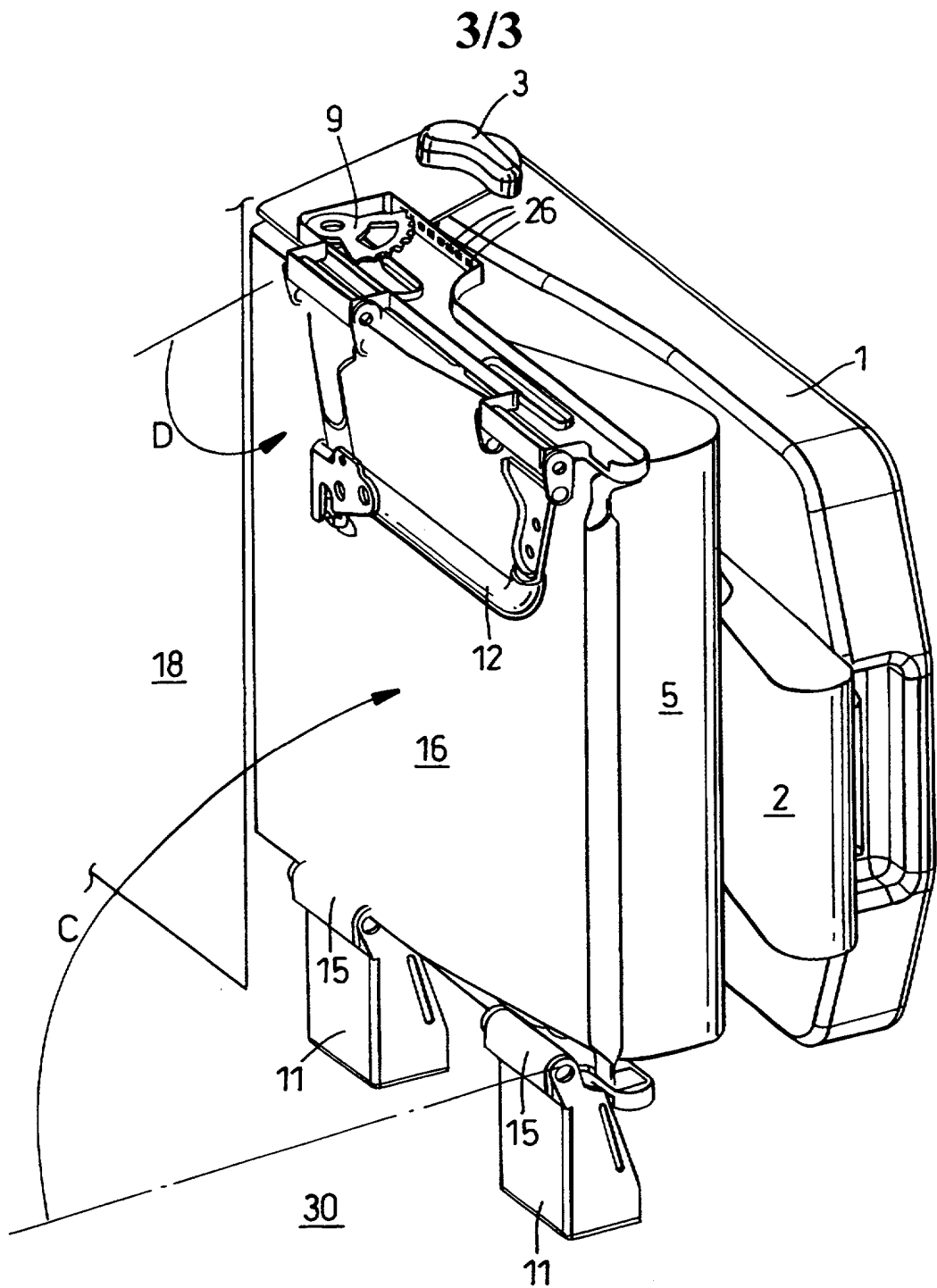
**Fig. 2**



**Fig. 3**



**Fig. 4**



***Fig. 5***

Motor Vehicle Assembly

The present invention relates to the field of automotive seating, and, in particular to so-called third row seating for motor vehicles.

It is known to provide additional seating in a motor vehicle to provide a third row of passenger seating. It will be understood that load space within a vehicle is highly desirable  
5 and with vehicle fitted with such third row seating load space is at a premium. In order that such third row seating does not occupy such valuable load space within the motor vehicle when not in use it is known to make such third row seating removable. However, removal, storage and subsequent reinstallation of such seating is at best inconvenient to a user of the motor vehicle.

10 It has also been proposed to make such third row seating collapsible into the floor of the load space such that while always present within a vehicle the available load space can be improved by manipulation of the seating. However, in some cases, it is known for the third row seating still to project from the floor of the load space of a vehicle and so reduce the load space available for use in comparison with a motor vehicle not fitted with such third row  
15 seating.

It is an advantage of the present invention that it overcomes these problems. Other advantages of the present invention will be made clear below.

According to a first aspect of the invention, a seating assembly comprises a cushion, a backrest and a carrier, the cushion and the backrest being connected about a first axis for  
20 relative movement between a deployed position and a stowage position, the carrier being pivotable about a side axis, and the cushion being moveable with respect to the carrier.

Preferably, the cushion slides with respect to the carrier.

Preferably, movement of the backrest about the first axis causes the cushion to move with respect to the carrier.

Preferably, latching means releasably secure the backrest and the cushion in each of the deployed and stowage positions. Preferably, the latching means are operated by a release  
5 lever.

Preferably, the backrest further comprises an adjustable head restraint.

Preferably, the carrier is provided with an inner support and an outer support. Conveniently, the side axis is provided between the carrier and the outer support. Preferably, the inner support is hingedly connected to the carrier. Preferably the inner support is  
10 provided with latching means. The inner support may be further provided with a lever to release the latching means.

Preferably, the seat assembly further comprises a drive means and a linkage, the linkage extending between the backrest and the drive means, the drive means operating to move the cushion with respect to the carrier on rotation of the backrest about the first axis. Preferably,  
15 the carrier further comprises a series of spaced openings and the drive means comprises a toothed element, the teeth of the toothed element being adapted to engage the openings of the carrier.

Preferably, the carrier further comprises a number of slots and in that the cushion is provided with guide means adapted to be located within the slots.

20 According to a second aspect of the invention, a seating arrangement comprises a seat assembly according to the first aspect of the present invention and a housing adapted to receive the seat assembly when the cushion and the backrest are in the stowage position and the carrier has been pivoted about the side axis to a vertical position.

According to a third aspect of the present invention, a motor vehicle comprises a body structure incorporating at least one seating arrangement according to the second aspect of the present invention.

The invention will now be described, by way of example only, with reference to the  
5 accompanying drawings, in which:

Figure 1 shows a side view of a seat assembly in accordance with the present invention;

Figure 2 shows a side view of a seat assembly in accordance with the present invention  
in a first upright position;

Figure 3 shows a side view of a seat assembly in accordance with the present invention  
10 in a second intermediate position;

Figure 4 shows a side view of a seat assembly in accordance with the present invention  
in a third folded position; and

Figure 5 shows a perspective view of a seat assembly in accordance with the present  
invention in a fourth storage position.

15 Referring first to Figure 1, there is shown a first embodiment of a seat assembly 20 in  
accordance with the present invention. The seat assembly 20 comprises a backrest 1 and a  
cushion 5. The backrest 1 includes a head restraint 2 at an upper end. The head restraint 2 is  
moveable to suit the individual requirements of the seat occupant.

The cushion 5 is mounted to a carrier 7. The carrier 7 is provided to a first side with an  
20 outer support 11 and to a second side with an inner support 12. In the illustrated  
embodiment, the outer support 11 takes the form of a pair of brackets connected by respective  
hinge means 15 to the carrier 7. The brackets are provided with means whereby the brackets  
may in use be mounted to a body 30 of a motor vehicle. The hinge means define an axis  
about which the carrier 7 may rotate with respect to the outer support 11.

The inner support 12 takes the form of a tubular member connected by hinge means at each of two ends to the carrier 7. The inner support 12 is provided with a latch 13 whereby in use, the inner support 12 may be releasably secured to a suitable mating means provided within the body of the motor vehicle. The latch 13 is conveniently provided with release  
5 means in the form of a lever 14.

The backrest 1 is adapted to pivot about means defining an axis 4 located at a lower region of the backrest 1. The means defining the axis 4 is connected to a first end of a linkage 8. A second end of the linkage 8 is connected to a rotatable toothed element 9. The rotating toothed element 9 is in turn rotatably connected to cushion 5. The cushion 5 is  
10 provided with a number of guide means 22 located within slots 10 provided in the carrier 7.

As may be seen most clearly from Figure 5, the carrier 7 is provided with a track defined by a series of spaced openings 26 in which the teeth 24 of the element 9 engage to control the movement of the cushion 5 during movement between a deployed and a stored position. Thus as the element 9 is rotated by the linkage 8, the teeth 24 progress along the  
15 openings 26. In this way, the cushion 5 is adapted to be slidingly driven between first and second positions corresponding to the deployed and stored positions of the seat assembly. Together, the linkage 8 and the element 9 are used to control the relative positions of the backrest 1 and cushion 5 between the deployed and stored positions.

Suitable latching means (not shown) are provided to releasably secure the cushion 5 in  
20 each of the first and second positions. The latching means also serve to secure the backrest 1 and the cushion 5 in their relative deployed and stored positions. The latching means may be released by the use of a release lever 3 connected to the linkage 8. Further means (not shown) may be provided to alter the relative angular position of the backrest 1 and the cushion 5 when in the deployed position to suit the requirements of the occupant of the seat  
25 assembly.



The seat assembly may further include a seat belt short end buckle (not shown). A seat belt long end (not shown) is mounted to the body of the motor vehicle.

Operation of the seat assembly will now be described with reference to the Figures. The seat assembly 20 is considered installed within a motor vehicle such that when in a deployed position it faces toward the front of the vehicle.

Firstly, to store the seat assembly 20 from the deployed position, the head restraint 2 where present is lowered until it sits on top of the backrest 1 (Figure 2). Release lever 3 is operated to release the latching means between the backrest 1 and the cushion 5 and the backrest 1 is pushed forward (arrow A). Pushing the backrest 1 causes it to pivot about the axis 4, thereby causing the linkage 8 to rotate the element 9 such that, in turn, the teeth 24 of element 9 drive the cushion 5 within the carrier 7 away from the first position toward the second position (arrow B) (Figure 3).

When the backrest 1 is fully lowered, and the cushion 5 in the second position, the backrest 1 and the cushion 5 are once again latched together. Lever 14 is then operated to release latch 13 to release the inner support 12 from the body 30 of the motor vehicle. The carrier 7 may now be pivoted about the hinge means 15 to move the backrest 1 and the cushion 5 from a generally horizontal position to a generally vertical stowage position (arrow C)(Figure 5). The inner support 12 may now be folded down against a lower surface 16 of the carrier 7 (arrow D). The lower surface 16 of the carrier 7 may be recessed to receive the inner support 12. Further latching means (not shown) are provided to enable the seat assembly 20 to be maintained in the upright position. The further latching means may conveniently act between the seat assembly 20 and adjacent body side trim 18 or on the hinge means 15.

The stowage position is conveniently located within the side body trim 18 of the motor vehicle. That is the outer support 11 is located within the side body trim 18, such that when

the seat assembly 20 is in the stowed position, the lower surface 16 of the carrier 7 is substantially flush with, or even slightly recessed from the side body trim 18 of the motor vehicle. Conveniently, the stowage position is located to a rear of a rear wheel arch of the motor vehicle. In the stowed position, an upper edge of the seat assembly 20 is maintained  
5 below the waist height of the vehicle, thereby contributing to the overall aesthetic of the motor vehicle.

To deploy the seat assembly 20 from the stowed position, the inner support 12 is folded out from the carrier 7 and the further latching means released. The carrier 7 is then rotated about the hinge means 15 to allow the latch 13 to secure the inner support 12 to the motor  
10 vehicle body. The backrest 1 and the cushion 5 are unlatched using release lever 3, to allow the backrest 1 to be raised. The raising of the backrest 1 causes the cushion 5 to be driven forward until the backrest 1 and the cushion 5 attain the deployed position where they are once again latched into position. The head restraint 2 can then be raised to the required position.

CLAIMS

1. A seat assembly for a motor vehicle comprising a cushion, a backrest and a carrier, the cushion and the backrest being connected about a first axis for relative movement between a deployed position and a stowage position, the carrier being pivotable about a side axis, and the cushion being moveable with respect to the carrier.
2. A seat assembly according to claim 1, characterised in that the cushion slides with respect to the carrier.
3. A seat assembly according to claim 1 or claim 2, characterised in that movement of the backrest about the first axis causes the cushion to move with respect to the carrier.
4. A seat assembly according to any previous claim, characterised in that latching means releasably secure the backrest and the cushion in each of the deployed and stowage positions.
5. A seat assembly according to claim 4, characterised in that the latching means are operated by a release lever.
6. A seat assembly according to any previous claim, characterised in that the backrest further comprises an adjustable head restraint.
7. A seat assembly according to any previous claim, characterised in that the carrier is provided with an inner support and an outer support.
8. A seat assembly according to claim 7, in which the side axis is provided between the carrier and the outer support.
9. A seat assembly according to claim 7 or claim 8, in which the inner support is hingedly connected to the carrier.

10. A seat assembly according to any of claims 7 to 9, characterised in that the inner support is provided with latching means.
11. A seat assembly according to claim 10, characterised in that the inner support is further provided with a lever to release the latching means.
12. A seat assembly according to any previous claim, characterised in that the seat assembly further comprises a drive means and a linkage, the linkage extending between the backrest and the drive means, the drive means operating to move the cushion with respect to the carrier on rotation of the backrest about the first axis.
13. A seat assembly according to claim 12, characterised in that the carrier further comprises a series of spaced openings and in that the drive means comprises a toothed element, the teeth of the toothed element being adapted to engage the openings of the carrier.
14. A seat assembly according to any previous claim, characterised in that the carrier further comprises a number of slots and in that the cushion is provided with guide means adapted to be located within the slots.
15. A seat assembly substantially as described herein with reference to and as illustrated in the accompanying drawings.
16. A seating arrangement for a motor vehicle comprising a seat assembly according to any previous claim and a housing adapted to receive the seat assembly when the cushion and the backrest are in the stowage position and the carrier has been pivoted about the side axis to a vertical position.
17. A seating arrangement for a motor vehicle substantially as described herein with reference to and as illustrated in the accompanying drawings.

18. A motor vehicle comprising a seating arrangement according to claim 16 or claim 17.



INVESTOR IN PEOPLE

Application No: GB 0003161.7  
Claims searched: All

10

Examiner: Richard Gregson  
Date of search: 25 May 2000

## Patents Act 1977 Search Report under Section 17

### Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.R): A4L (LAAR, LAL, LBPB, LBPC, LBPE)

Int Cl (Ed.7): B60N (2/00, 2/02, 2/04, 2/30): B61D 33/00, B64D 11/06

Other: Online: EPODOC, WPI, JAPIO

### Documents considered to be relevant:

| Category | Identity of document and relevant passage  | Relevant to claims |
|----------|--|--------------------|
| A        | GB 2336301 A (ROVER) - see diagrams in particular  | n/a                |
| A        | GB 2102674 A (GENERAL MOTORS)  | n/a                |
| Y        | WO 9617743 A (DAWSON et al.) - see diagrams, page 13 (22-30) and page 14 (1-3) in particular | 1-3 at least       |
| Y        | US 5489141 A (STRAUSBAUGH et al) - see diagrams in particular.                               | 1-3 at least       |

|   |   |   |  |
|---|---|---|--|
| X | Document indicating lack of novelty or inventive step   | A | Document indicating technological background and/or state of the art.  |
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