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(71) Applicant(s)  
**Nissan European Technology Centre Limited**  
**(Incorporated in the United Kingdom)**

**Washington Road, SUNDERLAND, Tyne & Wear,  
SR5 3ND, United Kingdom**

(72) Inventor(s)  
**Andrew Richard Henshaw**

(74) Agent and/or Address for Service  
**Marks & Clerk**  
**57-60 Lincoln's Inn Fields, LONDON, WC2A 3LS,  
United Kingdom**

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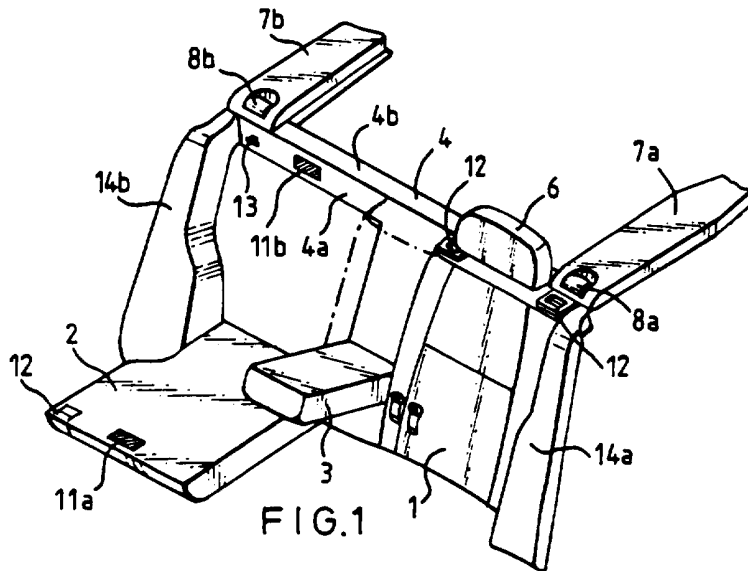
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On-Line Databases : **WPI**

(54) **Vehicle seat assembly**

(57) A transverse beam 4 fixed to a first tiltable seat back 1 extends behind a second tiltable seat back 2 and has its end portions releasably locked to respective side portions 7a, 7b of the vehicle body. Thus the first seat back 1 remains adequately supported in its operative position while the second seat back 2 is moved to its inoperative position (as shown).



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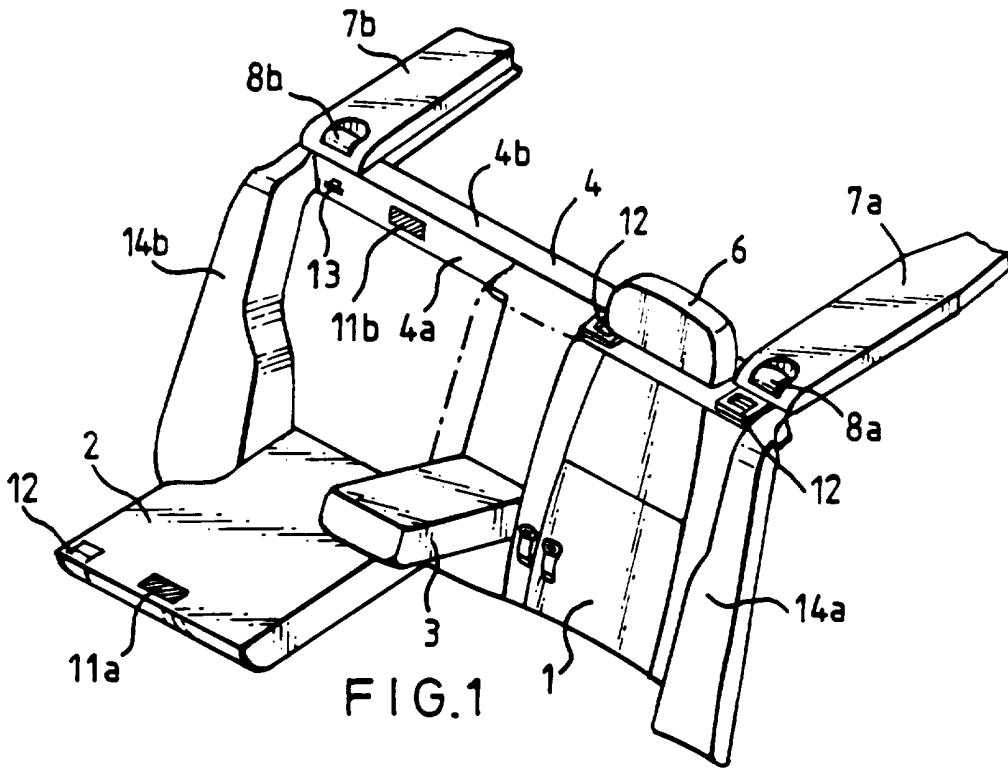


FIG. 1

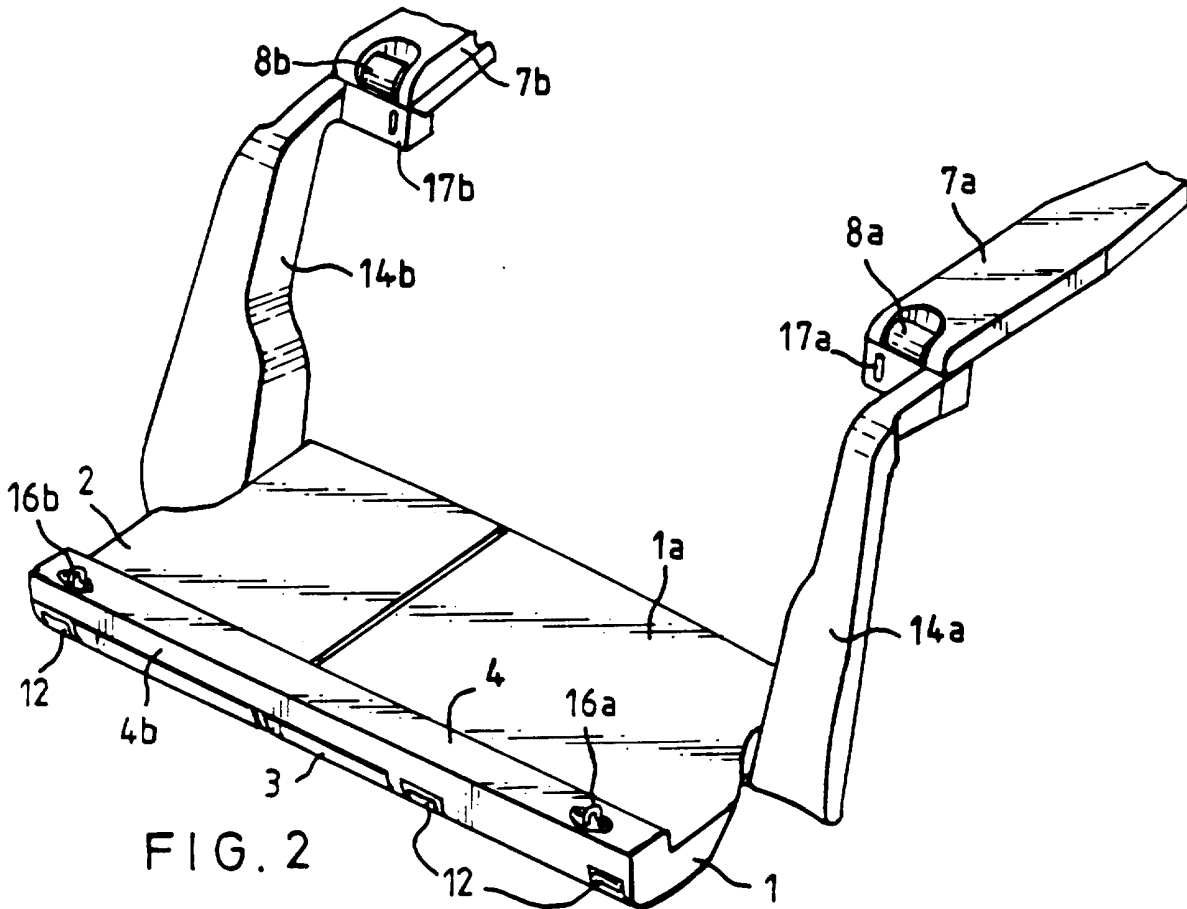


FIG. 2

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Vehicle Seat Assembly

This invention relates to a vehicle seat assembly and in particular to a seat assembly whose seat back is movable between a tilted inoperative position and an upright operative position.

The rear passenger seat of an estate car or hatchback usually has a seat back which can be tilted forwards to enlarge the load carrying space in the rear. It is now common to split the rear seat so that it has two tiltable seat backs, one of which is tiltable independently of the other. Usually, one of these seat backs will be wider than the other and the load carrying space is usually hidden from general view by a removable parcel shelf assembly which does not form a structural part of the vehicle.

In the upright operative position, the or each seat back of the rear passenger seat of such vehicles is releasably latched to part of the bodywork. However, as there is only a removable parcel shelf and not a structural support member to the rear of the seat backs, the inboard end of each set back is unrestrained and is only held in place by the integral structural rigidity of the seat backs.

Furthermore, there is now an increasing requirement for the upper part of the seat backs to incorporate one or more a seat belt retractors or at least a belt bearing location. This is particularly the case when three rear passengers are each to be provided with a three-point seat belt. As will be appreciated, in an impact situation, this arrangement can subject the seat

back to an additional load particularly in the area where the seat belt for the rear centre seat passes over or is attached to the centre portion or inboard end of one of the seat backs. This can cause dislodgement or distortion of the seat back, unless the seat back is provided with substantial structural reinforcement, which can cause the seat to become very cumbersome and unacceptably heavy to use.

Accordingly, it would be desirable to be able to provide a seat back with enhanced support in which the above concerns are at least alleviated.

The present invention provides a transverse beam fixed to one of a plurality of laterally juxtaposed seat backs and extending behind the other laterally juxtaposed seat back(s).

In particular, the invention provides a seat assembly for a vehicle having a body, the seat assembly including a first seat back and a second seat back, the seat backs being arranged side by side, each seat back being movable between an operative position and an inoperative position, characterised by a transverse beam fixed to the first seat back, the transverse beam extending to each side of the interior space of the vehicle body and therefore extending behind the second seat back, first releasable means for connecting one end portion of the transverse beam to a first side portion of the vehicle body, and second releasable means for connecting the other end portion of the transverse beam to a second side portion of the vehicle body.

Thus, so long as the first and second releasable means remain engaged, the first seat back is adequately supported in its operative position, while the second seat back can be moved to its inoperative position to increase the load space available.

The transverse beam also assists in supporting the second seat back in its operative position.

Preferred and optional features are set forth in the subsidiary claims.

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

Figure 1 is a fragmentary schematic front perspective view of a seat arrangement in a vehicle, with a first seat back in an upright operative position and a second seat back in a forwardly tilted inoperative position; and

Figure 2 is a similar view of a modified embodiment of the seat arrangement, but showing both seat backs in the inoperative position.

The seat arrangement shown in Figure 1 is mounted in the rear passenger space of a vehicle such as a hatchback or estate car. The seat arrangement comprises a seat which is split laterally in to two parts, one of which is wider than the other and occupies approximately  $\frac{2}{3}$  of the width of the passenger space, such seat arrangements being commonly known as 60:40 split rear seats. Each part includes a seat cushion (not shown) which is pivotably mounted to the floor of the vehicle body so as to be forwardly tiltable to an approximately vertical position, and a

seat back (1 or 2) which is also mounted on the floor so as to be pivotable between an upright operative position and a forwardly tilted inoperative position in which it is approximately horizontal. Figure 1 shows the first, wider seat back 1 in its operative position and the second, narrower seat back 2 in its inoperative position.

The first seat back 1 includes a central arm-rest 3 which is pivotable between a generally horizontal active position (shown in full line) and an upright inactive position (shown in chain-dotted line). Each seat back also carries a removable head-rest 6 at its upper end.

A transverse structural beam 4, which is incorporated into the first seat back 1 (being bolted, welded, or otherwise fixed to the rear panel 1a of the seat back 1), extends substantially horizontally across the interior space of the vehicle body immediately behind the upper end portions of the upright seat backs 1,2. The transverse beam 4, is preferably, a box beam (of square or rectangular cross-section) with an upright front wall 4a, against which the second, narrower seat back 2 rests, and a generally horizontally top wall 4b, which is substantially flush with the upper end of each seat back.

One end of the transverse beam 4 extends beneath an inwardly projecting side portion 7a of the vehicle body and is connected to this side portion by a first releasable locking device including a release lever 8a. Similarly, the other end of the beam 4 is connected to an opposite side portion 7b by a second

releasable locking device with a release lever 8b. The skilled person will be aware of many locking devices which are available for this purpose and which need not be described in detail here. In particular, a spring-loaded latching hook could engage a lug carried by the transverse beam.

The second seat back 2 is connected to the transverse beam 4, at a position spaced from the associated side bolster 14b of the vehicle body and also spaced from the first seat back 1, by means of a releasable locking device comprising cooperating parts 11a and 11b on the seat back and the beam respectively. Again, the skilled person will be aware of many locking devices which are available for this purpose and which need not be described in detail here. Further releasable locking devices may be provided for locking the outboard ends of the seat backs 1,2 to the side bolsters 14a,14b of the vehicle body in a conventional manner. A further releasable locking device may also be provided for connecting the arm-rest 3, in its raised inactive position, to the transverse beam 4.

The wider seat back 1 carries two seat belt retractors 12, and the other seat back 2 carries a single retractor 12. The beam 4 carries an actuating element 13 which engages in the last-mentioned retractor 12 when the seat backs 1,2 are in their operative positions. This belt retractor is of a type which is adapted to prevent belt pay-out when the actuating element 13 is not engaged in the retractor e.g. if the upright seat back 2 is not correctly connected to the transverse beam. Of course, each

belt retractor 12 prevents belt pay-out if it is in the wrong attitude, if it is subjected to abnormal acceleration, or if the belt is pulled abruptly. Such retractors are well known to those skilled in the art.

Accordingly, when the transverse beam is locked in position by the first and second releasable locking devices and the seat back 2 is locked to it by the releasable device 11a/11b, both seat backs are substantially reinforced against distortion or dislodgement arising from forces due to accidental impact, whether from the front or the rear.

When the narrower seat back 2 is to be tilted forwards, the locking device 11a/11b is disengaged (as well as any further locking device connecting the seat back 2 to the side bolster 14b), so that the seat back 2 is free to tilt forwards to its inoperative position independently of the other seat back 1. The transverse beam 4 thus remains in position to reinforce the seat back 1, and to assist in restraining large or heavy loads or to support a parcel shelf (which may be releasably hinged to the rear edge of the beam).

If it is required to lower both seat backs simultaneously, the locking device 11a/11b can be left engaged, the seat backs can be disengaged from the side bolsters 14a,14b, and the release levers 8a,8b can be operated so that the seat backs can be lowered as an integral unit with the beam 4. When the seat backs are to be raised again, the locking device 11a/11b can be disengaged so that the wider seat back 1 with the transverse beam



4 can be raised first, without the second seat back 2. Alternatively, the locking device 11a/11b can be left engaged and the seat backs 1,2 can be raised simultaneously.

In the modified embodiment illustrated in Figure 2, the transverse beam lies in front of the side portions 7a,7b of the vehicle body, and lugs 16a,16b on the end portions of the transverse beam 4 engage in locking devices 17a,17b which are releasable by the levers 8a,8b and which are fixed under the side portions 7a,7b.

Various modifications may be made within the scope of the invention. For example, the head-rests or the belt retractors could be carried by the transverse beam. The release levers 8a,8b could be arranged in different positions on the vehicle body or on the transverse beam 4. Any combination of split rear configurations could be used, e.g. 50:50 or 60:40, or even a seat split into three or more parts. Thus, the provision of the transverse beam fixed to one seat back allows great flexibility in the interior design of the vehicle.

Claims:-

1. A seat assembly for vehicle having a body, the seat assembly including a first seat back and a second seat back, the seat backs being arranged side by side, each seat back being movable between an operative position and an inoperative position, characterised by a transverse beam fixed to the first seat back, the transverse beam extending to each side of the interior space of the vehicle body and therefore extending behind the second seat back, first releasable means for connecting one end portion of the transverse beam to a first side portion of the vehicle body, and second releasable means for connecting the other end portion of the transverse beam to a second side portion of the vehicle body.
2. An assembly as claimed in claim 1, in which the transverse beam is adjacent an upper end portion of each seat back in its operative position.
3. An assembly as claimed in claim 2, in which the transverse beam is substantially flush with the upper end of each seat back in its operative position.
4. An assembly as claimed in any preceding claim, in which the transverse beam has an upright portion, adjacent to the second seat back in its operative position, and a generally horizontal portion.
5. An assembly as claimed in any preceding claim, in which the transverse beam is a box beam.
6. An assembly as claimed in any preceding claim, in which the first seat back includes an arm-rest which is movable between a generally horizontal active position and an upright inactive

position, when the seat back is in its operative position.

7. An assembly as claimed in claim 6, including further releasable means for connecting the arm-rest in its inactive position to the transverse beam.

8. An assembly as claimed in any preceding claim, including further releasable means for connecting the second seat back to the transverse beam at a position spaced from the side portion of the vehicle body associated with the second seat back.

9. An assembly as claimed in any preceding claim, in which the transverse beam carries at least one head-rest.

10. An assembly as claimed in any preceding claim, in which the transverse beam carries a seat belt retractor.

11. An assembly as claimed in any preceding claim, in which the second seat back carries a seat belt retractor.

12. An assembly as claimed in claim 11, in which the transverse beam carries an element which engages with the seat belt retractor when the second seat back is in its operative position, the retractor preventing belt pay-out when the element is not engaged with the retractor.

13. An assembly as claimed in any preceding claim, in which the first and second seat backs together occupy substantially the whole width of the interior space of the vehicle.

14. An assembly as claimed in any preceding claim, in which the first seat back occupies at least half of the width of the interior space of the vehicle.

15. A seat assembly for a vehicle, substantially as described with reference to, and as shown in, Figure 1 or Figure 2 of the accompanying drawings.

**Relevant Technical Fields**

(i) UK Cl (Ed.N) A4L (LAAR, LBBB, LBPB); A3V (VRC);  
 B7B (BEA)

(ii) Int Cl (Ed.6) B60N 2/30, 2/32, 2/36

**Databases (see below)**

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii) ONLINE DATABASES: WPI

Search Examiner  
 D BUCKLEY

Date of completion of Search  
 6 JANUARY 1995

Documents considered relevant following a search in respect of Claims :-  
 1 to 15

**Categories of documents**

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|---|---|
| <b>X:</b> Document indicating lack of novelty or of inventive step.   | <b>P:</b> Document published on or after the declared priority date but before the filing date of the present application.        |
| <b>Y:</b> Document indicating lack of inventive step if combined with one or more other documents of the same category. | <b>E:</b> Patent document published on or after, but with priority date earlier than, the filing date of the present application. |
| <b>A:</b> Document indicating technological background and/or state of the art.   | <b>&amp;:</b> Member of the same patent family; corresponding document.   |

Category	Identity of document and relevant passages	Relevant to claim(s)
A	GB 2274814 A (GENERAL ENGINEERING) see drawings	
A	US 4493505 (TOYOTA) see support 5, Figures 3 and 4	
A	DE 4230538 A1 (KASZYNSKI) see Figure 1	

**Databases:** The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).