

(43) Date of A Publication 22.11.2000

(21) Application No 0011057.7

(22) Date of Filing 08.05.2000

(30) Priority Data

(31) 19921453 (32) 08.05.1999 (33) DE

(71) Applicant(s)

DaimlerChrysler AG
(Incorporated in the Federal Republic of Germany)
Epplestrasse 225, D-70567 Stuttgart,
Federal Republic of Germany

(72) Inventor(s)

Armin Kienzle
Christian Wobst

(74) Agent and/or Address for Service

Jensen & Son
70 Paul Street, LONDON, EC2A 4NA, United Kingdom

(51) INT CL⁷

B60N 2/36 // E05D 3/06

(52) UK CL (Edition R)

A4L LBDB L109
E2F FCA

(56) Documents Cited

EP 0516512 A1 DE 019605191 A1 JP 090216529 A
US 5795023 A

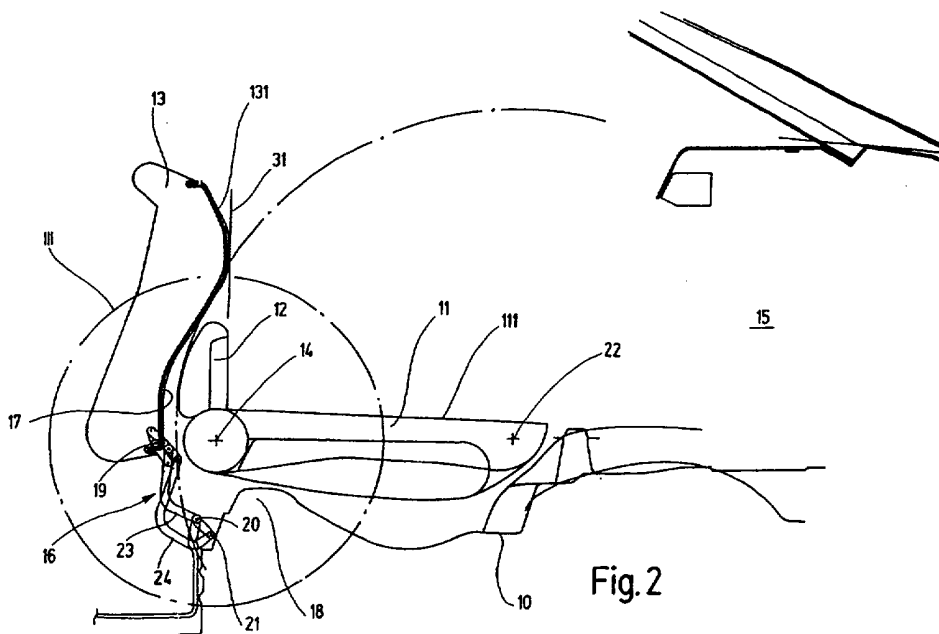
(58) Field of Search

UK CL (Edition R) A4L LAAR LAL LBA LBDB LBDC
LBPB LBPC LBPE , E2F FCA
INT CL⁷ B60N 2/30 2/32 2/36 , E05D 3/06
Online: EPODOC, WPI, JAPIO.

(54) Abstract Title

Rear seat arrangement for vehicles

(57) A rear seat arrangement for vehicles, has a backrest 11 which bears at least one head restraint 12 and can be folded about a pivot spindle 22 secured on the vehicle, and a seat part 13 which can be pivoted about a multi-joint hinge 16 secured on the seat and on the vehicle. In order to enlarge the luggage compartment 15 lying behind it, the seat part 13 is pivoted upright onto the front seat arrangement and the backrest 11 is pivoted into the space released by the seat part. In order to avoid the head restraints 12 wearing out when folding over the rear seat arrangement, the at least one head restraint 12 is arranged on the backrest 11 in a manner which allows it to pivot away to the rear, the seat part is graduated towards the front end on its underside 31, and the multi-joint hinge 16 is designed as a seven-joint hinge in such a manner that the seat part 13, when pivoted, is raised sufficiently far vertically that the head restraint 12, which is pivoted away approximately at right angles with respect to the rear side of the backrest 11, enters into the front graduation 17 on the seat underside 131 and is largely flush with the contour of the underside 131 of the seat.



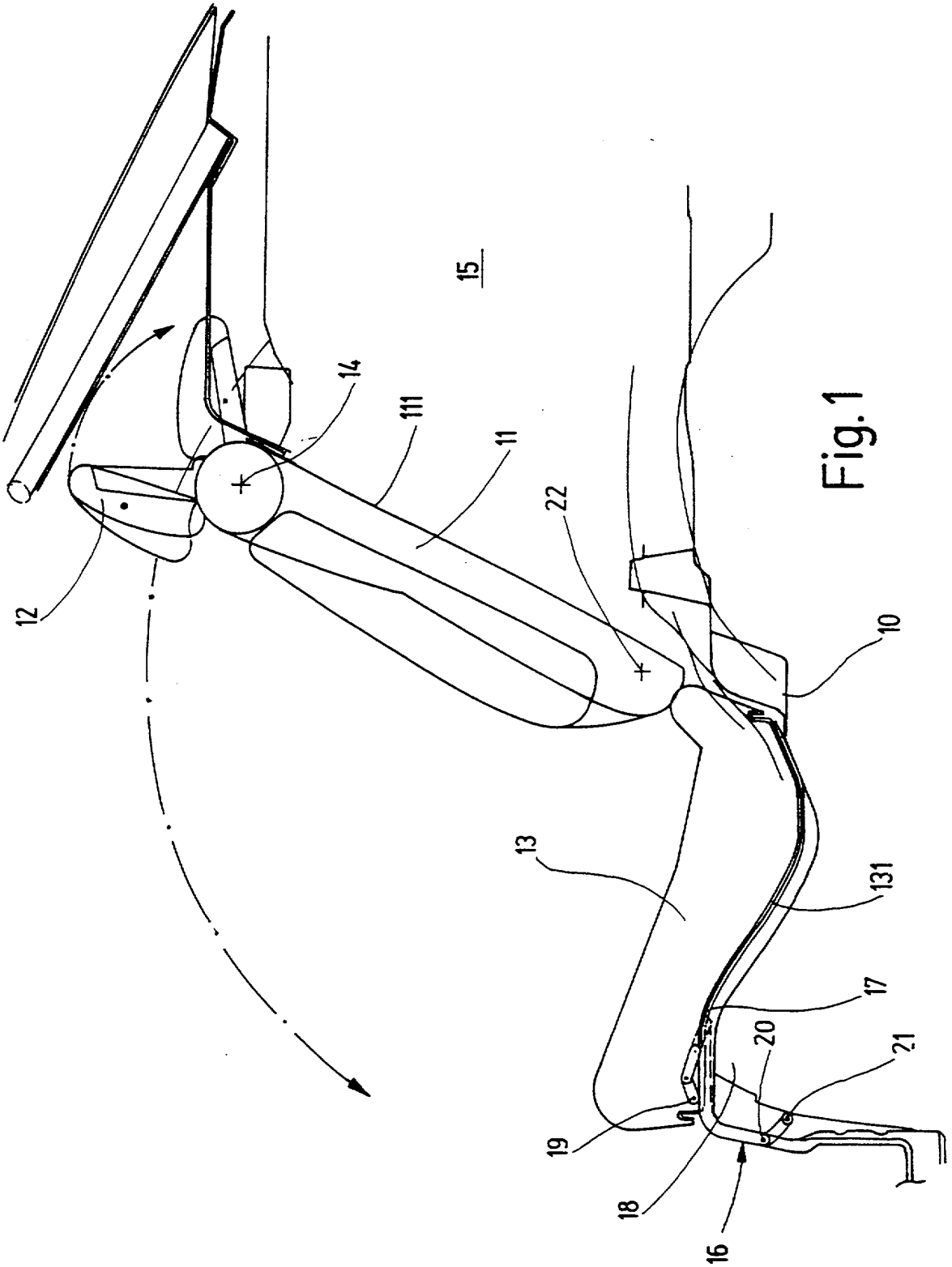


Fig. 1

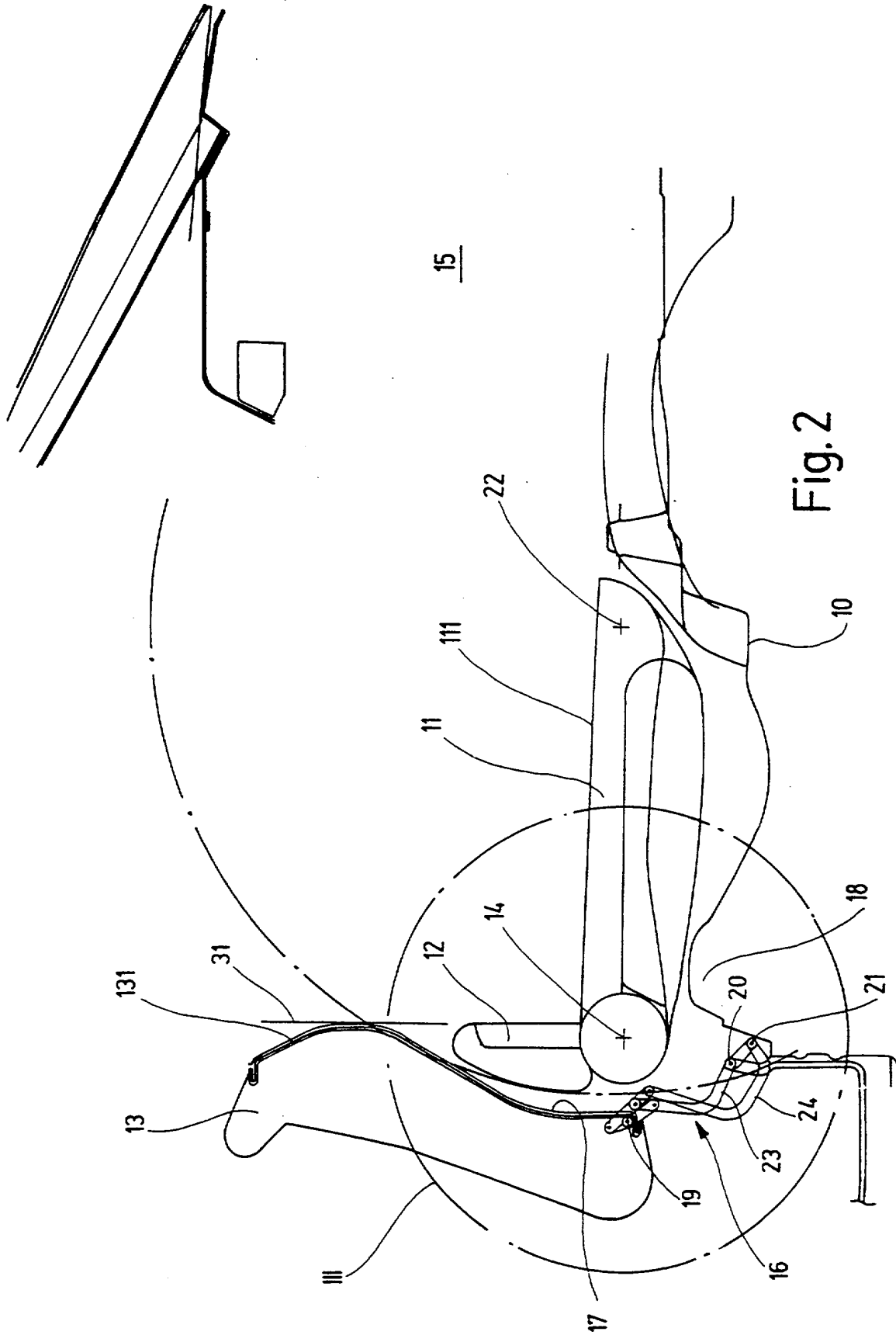


Fig. 2

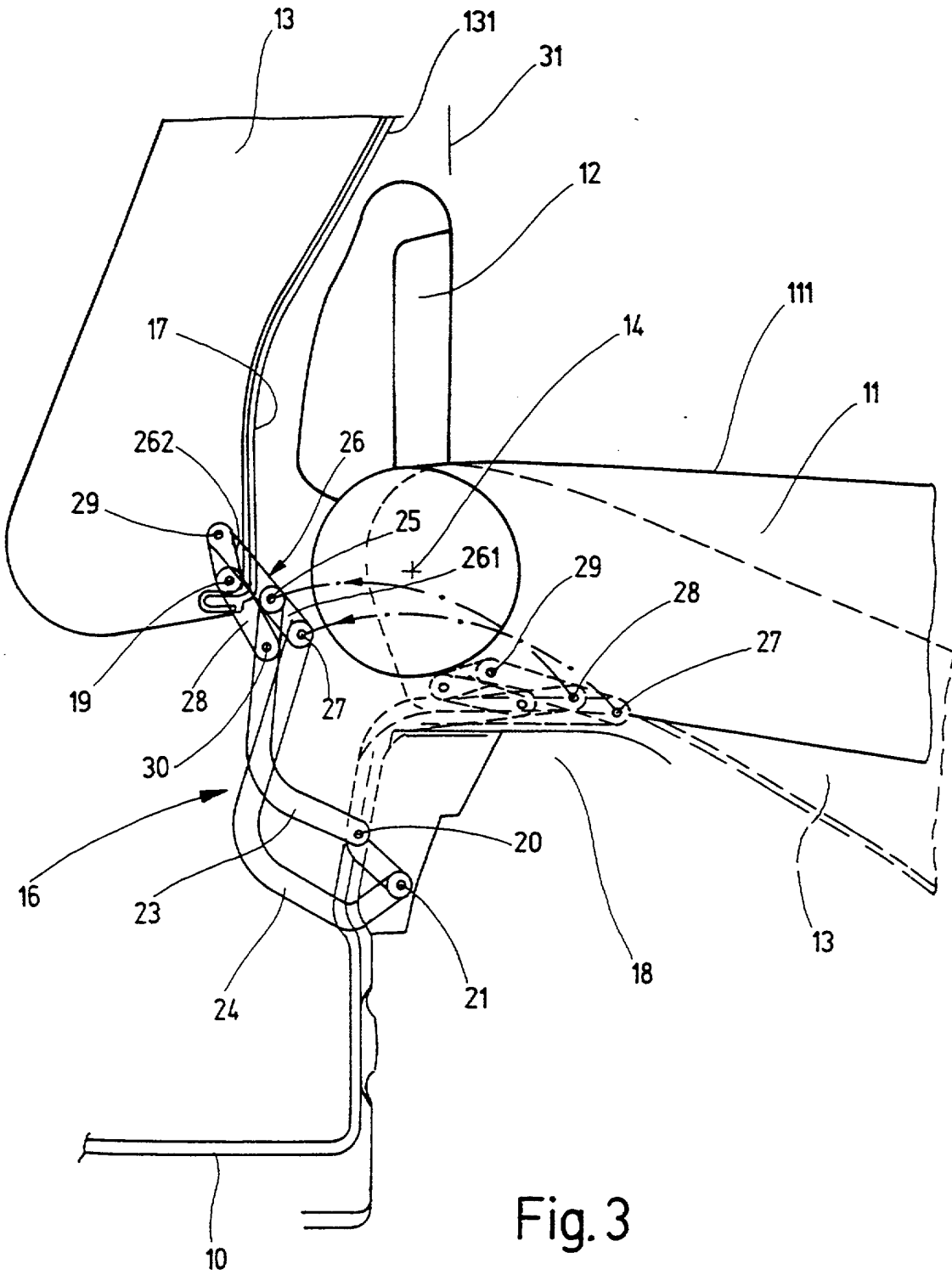


Fig. 3

1

Rear seat arrangement for vehicles

The invention relates to a rear seat arrangement for vehicles, in particular but not exclusively, passenger cars.

With rear seat arrangements of this type, the loading space in saloons and estate cars can be enlarged by folding over the seat part and backrest, the use of a multi-joint hinge making it possible for the seat part to be folded a good distance forwards.

In the case of a known arrangement of this type (DE 39 13 529 A1), the multi-joint hinge is designed as a four-joint hinge which is formed by a link extending between a first joint, which is fixed on the bodywork, and a second joint, which is fixed on the seat part, the second joint, in the sitting position of the seat part, being situated between the first joint and the backrest and lower than the first joint. This design of the multi-joint hinge means that a separate lock, which is customary per se, in the rear region of the seat part, which lock is intended to prevent unintentional folding over of the seat part in the event of severe deceleration, can be omitted, because an inertia force acting in the direction of travel transmits to the seat part a moment which reinforces the position of the seat part.

A rear seat arrangement, which is likewise known, in a motor vehicle (DE 35 46 147 A1) has a four-hinge mechanism which consists of a seat-cushion-side element, which is connected to the seat cushion, a floor-side element, which is directed downwards at the front end of the seat part and is connected to the vehicle floor essentially perpendicular with respect to the longitudinal axis of the vehicle, a lower element, which is connected with its opposite upper and lower ends to the front end section of the seat-cushion-side element and, respectively, to the lower end section of the floor-side element via a bolt connection, and also of an upper element, which is connected with its opposite rear and front ends to the rear end section of the seat-cushion-side element and, respectively, to the lower end section of the floor-side element via a bolt connection in each case. With this four-hinge mechanism, the force required to put the seat part upright is reduced, so that the pivoting into its upright position can be carried out in a simple manner.

The backrests of current rear seat arrangements are conventionally fitted with a respective head restraint which is assigned to a seat and, in the event of the rear seat arrangement being unoccupied, can be pivoted away to the rear in the direction of the rear side of the backrest, to improve the driver's view. For folding the backrest over, when enlarging the loading space, these head restraints have to be removed, since they either

impede the folding-down of the backrest behind the raised-up seat part, or else reduce the size of the additional loading area obtained by folding the backrest over.

In order to make it superfluous to take the head restraint away when folding the rear seat arrangement, in the case of a known rear seat arrangement which can be folded in order to enlarge the loading space (DE-33 25 927 C1), the seat cushion is provided on the underside with recesses and can be pivoted into an approximately upright, vertical position about a pivot spindle provided on its front edge. Following the release of a catch assigned to each head restraint, the head restraints can be pivoted rearwards through 90°, and the backrest can be turned over forwards about a spindle arranged on its lower region. At the process of turning the backrest over, each head restraint has entered into one of the recesses. This necessitates precise co-ordination of the dimensions of the backrest and of the arrangement of the pivot spindles of the seat cushion and backrest, and also of the recesses in the underside of the seat cushion.

The present invention seeks to improve a rear seat arrangement of the type mentioned at the beginning to the effect that folding over the seat part and backrest is possible without the head restraint being taken away.

According to the present invention there is provided a rear seat arrangement for vehicles, having a backrest which carries at least one head restraint and is foldable about a pivot secured on the vehicle from an upright sitting position into an approximately horizontal folded-over position in which its rear side forms a load surface, and having a seat part which has, on its underside, a graduation extending towards the front end and, in order to enlarge a luggage compartment, which is pivotable by means of at least one multi-joint hinge, which is arranged in the vicinity of the front end of the seat part and is secured on the seat and on the vehicle, from an approximately horizontal sitting position into a folded-over position in which it stands approximately upright on a front seat arrangement, wherein the at least one head restraint is arranged on the backrest in a manner which allows it to pivot away to the rear, the seat part is graduated towards the front end on its underside, and the multi-joint hinge is such that the seat part, when pivoted into its upright folded-over position, is raised sufficiently far vertically that the head restraint, which is pivoted away approximately at right angles with respect to the rear side of the backrest, enters into the front graduation on the seat underside and is largely flush with the contour of the seat underside.

By means of the multi-joint hinge, the seat part, when folded over, is shifted forwards to the maximum extent, and by means of its structural design according to the invention is raised sufficiently far in its vertical position leaning against the front seat

arrangement that a graduation of the seat part, which graduation exists on the underside of the seat part in the front region thereof, comes to lie in the region of the upper end of the folded-over backrest, with the result that the upper end of the backrest, together with the head restraint folded down through approximately 90° onto the rear side, are accommodated in the graduation region of the seat part. The underside of the raised-up seat part, and the rear side of the head restraints, which are put vertically upright in the folded-over horizontal position of the backrest, lie in a continuous plane bounding the loading space. Since the graduation at the front end of the seat cushion on the underside thereof exists per se, it can be used to accommodate the head restraint, and the formation of separate recesses can be omitted.

Advantageous embodiments of the rear seat arrangement according to the invention together with expedient developments and refinements of the invention are specified in the other patent claims.

According to a preferred embodiment of the invention, the multi-joint hinge is designed as a seven-joint hinge which is secured on the vehicle floor with two joint points in front of the front side of a transverse support which is formed on the vehicle floor, protrudes above the floor level and on which the seat part in the sitting position is supported in the region of its graduation, and is secured with one joint point on the seat underside in the graduation region thereof.

The invention is described in more detail below with reference to an embodiment illustrated in the drawing, in which, in each case in schematic illustration:

Fig. 1 shows a rear seat arrangement for a car, in the sitting position,

Fig. 2 shows the rear seat arrangement in Fig. 1, in a folded-over position serving to enlarge the loading space, and

Fig. 3 shows an enlarged illustration of the detail III in Fig. 2.

The rear seat arrangement, outlined in Figs. 1 and 2, for a car comprises a backrest 11, which is fitted with a head restraint 12 per seat, and a seat part 13. As is indicated in Fig. 1, the head restraints 12 are held on the upper edge of the backrest 11 in a manner which allows them to pivot about a pivot spindle 14, and, in the event of the rear seat arrangement not being occupied, can be folded down to the rear in the direction of the rear side 111 of the backrest 11, to improve the driver's view. The backrest 11, which can also be of divided design, is secured on the vehicle and, after a lock is cancelled, can be pivoted forwards about a pivot spindle 22 secured on the vehicle. In order to enlarge a luggage compartment 15 situated behind the backrest 11, the seat part 13 can be moved from its

sitting position, which is illustrated in Fig. 1, into an upright folded-over position, which is illustrated in Fig. 2, in which it stands approximately vertically behind a front seat arrangement, and after that the backrest 11 can be moved into an approximately horizontal folded-over position, which is illustrated in Fig. 2, in which its rear side 111 forms a loading area. The pivoting of the seat part 13 is made possible by two multi-joint hinges 16, one of which is secured on the right, and one on the left, on the seat and on the vehicle in the vicinity of the front end of the seat part 13.

The seat part 13 is graduated towards the front end on its underside 131 and is supported, with this front graduation 17, on a transverse support 18, which is formed on the vehicle floor 10 and protrudes above the floor level, while the said seat part is accommodated in the rear region by a floor pan tapering away from the transverse support 18. The multi-joint hinge 16, which is designed as a seven-joint hinge, is secured with one joint point 19 in the graduation region 17 on the underside 131 of the seat part 13, and on the vehicle floor 10 with two joint points 20, 21 on the front side, as seen in the direction of travel, of the transverse support 18. As the enlarged illustration in Fig. 3 shows, the multi-joint hinge 16 comprises two angled links 23, 24 which are secured pivotably at their one link end on the vehicle floor 10, with the joint points 20, 21, in front of the front side of the transverse support 18, the joint point 20 of the first link 23 being situated above the joint point 21 of the second link 24, the hinge further comprising a two-armed lever 26 which is secured pivotably at the other link end of the first link 23 at the joint point 25 and to whose one lever arm 261 the other link end of the second link 24 is coupled at joint point 27, and also comprises a toggle lever 28 which is coupled on the end sides to the other lever arm 262 at joint point 29, at one end, and, at the other end, to the first link 23 at a distance from its link end supporting the two-armed lever 26, at joint point 30, and is secured pivotably on the underside 131 of the seat part 13 with its toggle point (joint point 19).

In the sitting position of the rear seat arrangement, the multi-joint hinge 16 assumes the position illustrated in Fig. 1, in which the two angled links 23, 24 extend along the front side of the transverse support 18, and the lever 26 and toggle lever 28 are enclosed between the upper side of the transverse support 18 and the underside 131 of the seat part 13, in the region of the graduation 17. This position of the multi-joint hinge 16 is additionally drawn in Fig. 3 with dashed lines. If the seat part 13 is folded forwards via the multi-joint hinge 16, the joint points 27 and 28 move on overlapping circular paths, as marked out in Fig. 3 by dashed-dotted arrow lines, and at the end of the pivoting movement, the multi-joint hinge 16 assumes its position illustrated in Fig. 3 by solid lines. In this position, the seat part

13 is not only pivoted forwards to the maximum extent into the foot well, but at the same time is raised vertically over a distance and bears against the backrests of the front seat arrangement. The vertical, raised distance is dimensioned here in such a manner that the end of the backrest 11, which is folded forwards about its pivot spindle 22 secured on the vehicle, can, together with the head restraint 12, which is pivoted away through approximately 90° in the direction of the rear side 111 of the backrest 11, pivot into the graduation 17 on the underside 131 of the seat part 13 (Figs. 2 and 3). As indicated in Figs. 2 and 3 by a locating mark 31, in this arrangement the rear side of the head restraint 12 and the contour of the underside 131 of the seat part 13, which contour extends the furthest in the direction of the luggage compartment 15, lie in a common plane.

Claims

1. A rear seat arrangement for vehicles, having a backrest which carries at least one head restraint and is foldable about a pivot secured on the vehicle from an upright sitting position into an approximately horizontal folded-over position in which its rear side forms a load surface, and having a seat part which has, on its underside, a graduation extending towards the front end and, in order to enlarge a luggage compartment, which is pivotable by means of at least one multi-joint hinge, which is arranged in the vicinity of the front end of the seat part and is secured on the seat and on the vehicle, from an approximately horizontal sitting position into a folded-over position in which it stands approximately upright on a front seat arrangement, wherein the at least one head restraint is arranged on the backrest in a manner which allows it to pivot away to the rear, the seat part is graduated towards the front end on its underside, and the multi-joint hinge is such that the seat part, when pivoted into its upright folded-over position, is raised sufficiently far vertically that the head restraint, which is pivoted away approximately at right angles with respect to the rear side of the backrest, enters into the front graduation on the seat underside and is largely flush with the contour of the seat underside.

2. An arrangement according to Claim 1, wherein the multi-joint hinge is a seven-joint hinge which is secured on the vehicle floor with two joint points in front of the front side of a transverse support which is formed on the vehicle floor, protrudes above the floor level and on which the seat part in the sitting position is supported in the region of its graduation, and is secured with one joint point on the seat underside in the region of the graduation.

3. An arrangement according to Claim 2, wherein the two joint points which are secured on the vehicle are arranged at a distance below the upper side of the transverse support, which upper side supports the seat part .

4. An arrangement according to Claim 2 or 3, wherein the multi-joint hinge has two angled links which are secured pivotably at their one link end on the vehicle floor in front of the front side of the transverse support, a two-armed lever which is secured pivotably at the other end of the first link and to whose one lever arm the other link end of the second link is coupled, and a toggle lever which is coupled on the end sides to the other

7
lever arm and to the first link respectively, at a distance from its link end supporting the two-armed lever, and is secured pivotably on the underside of the seat part with its toggle point.

5. An arrangement according to Claim 4, wherein the joint point, secured on the vehicle, of the first link lies above the joint point, secured on the vehicle, of the second link.

6. A rear seat arrangement for vehicles, substantially as described herein, with reference to and as illustrated in, the accompanying drawings.



Application No: GB 0011057.7
 Claims searched: All

Examiner: Richard Gregson
 Date of search: 14 September 2000

Patents Act 1977
Search Report under Section 17

Databases searched:

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

UK CI (Ed.R): A4L (LAAR, LAL, LBDB, LBDC, LBPB, LBPC, LBPE, LBA) : E2F (FCA)

Int CI (Ed.7): B60N (2/30, 2/32, 2/36), E05D (3/06)

Other: Online: EPODOC, WPI, JAPIO.

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
Y	EP 0516512 A1 (PEUGEOT-CITROEN) - see diagrams in particular.	1
Y	DE 19605191 A1 (SCHARWAECHTER) - see diagrams in particular.	1
A	US 5795023 A1 (TETSUYA) - see whole document.	n/a
Y	JP 9-216529 A (DAIHATSU) - see diagrams in particular.	1

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