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(56) Documents Cited
GB 2106380 A EP 0825061 A2

(58) Field of Search
UK CL (Edition Q) **A4L LBEP LBEQ LCC , E2F FAE**
INT CL⁶ **B60N 2/48 , E05D 11/10**

(54) Abstract Title

A head restraint assembly

(57) A head restraint 13 for a motor vehicle is adapted to undergo pivotal movement between forward and rearward positions and comprises a securing means and a padded headrest 12 covering a support member 11. The securing means holds the head restraint 13, during normal use, between the forward and rearward positions but is arranged to allow movement of the head restraint 13 towards the forward position upon severe deceleration of the motor vehicle. The securing means comprises a helical coil locking member 14 engaged with a transverse support rod 24 forming part of the support member 11, wherein the coil locking member 14 is provided with an end portion 19 extending to form a release lever 20. Rotation of the release lever 20 in a pre-determined direction increases the internal diameter of the coil locking member 14 such that its gripping effect on the transverse support rod 24 is diminished, thereby facilitating rotation of the head restraint 13.

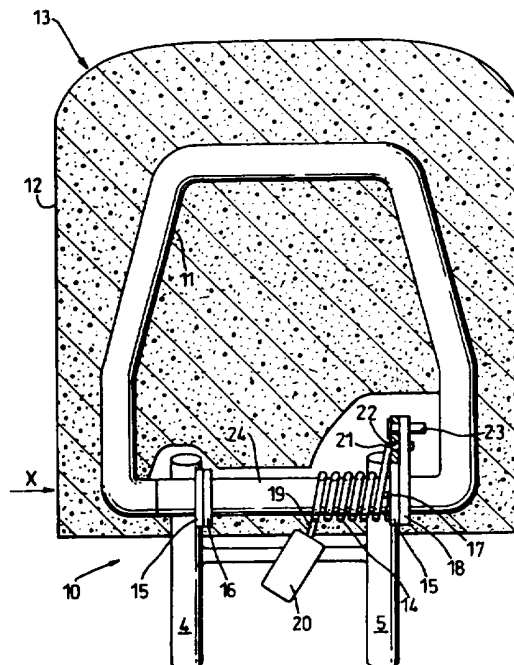


Fig. 1

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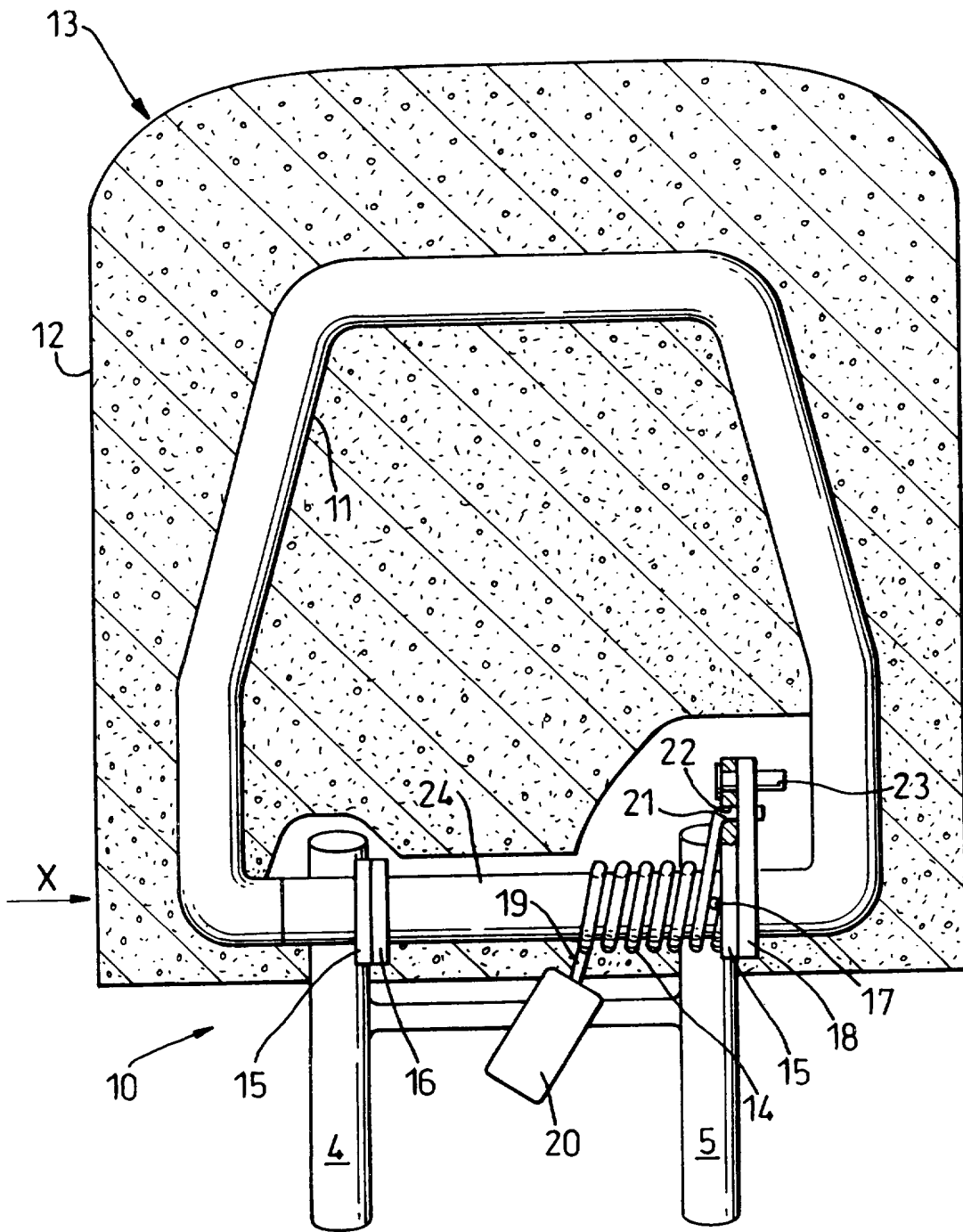


Fig. 1

A Head Restraint Assembly

This invention relates to seat assemblies and in particular to a seat assembly having a movable head restraint and means for securing said head restraint in a pre-determined fore-aft position.

5 It is known from GB-A-2106380 to provide a head restraint for a motor vehicle seat that can be automatically swung into an extreme forward position under the force of inertia acting on the head restraint when the vehicle is subject to severe deceleration.

10 It is a disadvantage with such a prior art arrangement that the mechanism required to achieve said function is complicated and therefore relatively expensive to manufacture.

15 It is an object of this invention to provide an improved head restraint assembly for a motor vehicle.

According to the invention there is provided a head restraint assembly comprising an attachment means for attaching a head restraint member to a structural part of a motor vehicle, the head restraint member being pivotally
20 connected to a transverse rod forming part of said attachment means for movement between a forward and a rearward position, the head restraint having a padded headrest member covering a support member and a securing means to hold the head restraint during normal use in any

position between said forward and rearward positions but being arranged to allow movement of the head restraint towards said forward position under the force of inertia acting on the head restraint member when the vehicle is
5 subject to severe deceleration wherein the securing means comprises a helical coil locking member engaged with a transverse support rod forming part of said support member, said locking member having an internal diameter that in the relaxed state is less than the diameter of the transverse
10 support rod and having a first end portion for abutment against part of said attachment means and a second end portion extending to form a release lever such that upon rotation of the second end portion in a pre-determined direction the internal diameter of the coil locking member
15 is increased so as to reduce the gripping effect on the transverse support rod with which it is engaged thereby allowing the head restraint member to be rotated relative to the attachment means.

The structural part of the motor vehicle may be a
20 backrest portion of a seat

The attachment means may comprise of at least one rod for engagement with the backrest portion of the seat to the or each of which is attached at its upper end a bearing member used to pivotally connect the head restraint member
25 to the attachment means.

The first end of the helical locking means may be engaged with an aperture in the bearing member.

There may be two rods each of which has a bearing member attached thereto.

5 The first end of the helical locking means may be engaged with an aperture in one of the bearing members.

There may be two helical locking means engaged with the support rod to hold the head restraint in position.

The two helical locking means may be wound in opposite
10 directions.

A spring may be interposed between the attachment means and the head restraint member to urge the head restraint in a rearward direction.

The support member is a peripheral frame of which the
15 transverse support rod forms a part.

The invention will now be described by way of example with reference to the accompanying drawing of which:-

Fig.1 is a front view of part of a head restraint assembly according to the invention.

20 With reference to the drawing there is shown a head restraint assembly 10 comprising of a head restraint member

13 pivotally connected to an attachment means in the form of two downwardly projecting rods 4, 5.

The head restraint member 13 comprises of a foam filled headrest 12 and a support frame 11 which is pivotally
5 connected to the rods 4, 5 for movement between a forward position and a rearward position. The support frame 11 has a transverse support rod 24 which is engaged with a pair of spaced apart bearing plates 15 each of which is secured to a respective one of the downwardly projecting rods 4, 5.
10 To control end float of the transverse support rod 24 with respect to the bearing plates 15 an end stop plate 16 is attached to the transverse support rod 24 in a position adjacent to one of the bearing plates 15 and an end float control pin 17 is press fitted into an aperture in the
15 transverse support rod 24 at a position adjacent to the other of said bearing plates 15.

An archimedean spiral spring 18 is interposed between one of the bearing plates 15 and the transverse support rod 24. The inner end of said spring 18 being engaged with a
20 slot (not shown) in the transverse support rod 24 and the outer end of the spring 18 being in abutment with a pin 23 extending out from an aperture in one of the bearing plates 15. The spring 18 is so arranged that it will bias the head restraint member in a rearward direction.

25 To hold the head restraint member 13 in any position between forward and rearward positions during normal use a

securing means in the form of a helical coil locking member 14 is engaged with the transverse support rod 24. The locking means 14 is, in a normally relaxed state, of a smaller internal diameter than the external diameter of the transverse support rod 24 with which it is engaged. A first end portion 21 of the locking means 14 extends away from the transverse support rod 24 and is engaged in an aperture 22 in one of the bearing plates 15. A second end portion 19 of the locking means 14 extends away from the transverse support rod 24 and has a plastic handle 20 moulded thereon. The arrangement of the locking means 14 is therefore such that it acts as a clutch between the transverse support rod 24 and the bearing plate 15 with which its first end portion is engaged. The gripping force exerted by the locking means 14 is such that during normal use the head restraint member 13 is maintained in any position between its most forwardly and most rearwardly positions. However, if the vehicle undergoes a severe deceleration then the inertia of the head restraint member which has a centre of gravity will force slippage to occur between the transverse support rod 24 and the locking means 14. This allows the head restraint member 13 to move forwardly thereby in some manner mimicking the forward motion of an occupant's head during such a deceleration.

During normal use the locking means 14 can be released by applying force to the handle 20 in such a direction that it tends to unwind the locking member 14 thereby increasing

the internal diameter of the locking means 14 and releasing its grip upon the transverse support rod 24. This allows the spring 18 to bias the head restraint member 13 rearwardly so long as the releasing force is applied to the handle 20. As shown in Figure 1 if viewed from the direction 'X' the handle 20 will need to be rotated in a counter clockwise direction to release the gripping load of the locking means 14.

To adjust the head restraint member 13 from its most rearward position to a more forward position an occupant of the vehicle merely needs to apply a load to the head restraint member 13 in a forward direction of sufficient magnitude to overcome the locking member 14.

It will therefore be seen that in a very simple and efficient manner a locking means has been provided that allows both adjustment of the head restraint member 13 during normal use and, in the event of a severe deceleration, permits the head restraint member 13 to move forwardly to assist with the reduction of whiplash injuries. It will also be appreciated that the locking member 14 is not released by the forward movement of the head restraint member 13 as its first end portion 21 is engaged with a stationary bearing plate 15 and not a moving part.

It will be appreciated that instead of one locking member there could be two locking members engaged with the

transverse support rod 24 in which case the second locking means would be a mirror image of that shown in Figure 1 having a helical locking member that is wound in an opposite direction to that shown.

5 Although the head restraint assembly has been described with reference to a head restraint having a peripheral frame, it will be appreciated that such a frame is not an essential element the head restraint. It could, for example, be made from a resilient plastics material but in
10 this case it may be necessary to include a weight to the headrest assembly which is offset from its axis of pivoting to produce sufficient inertia to overcome the holding force of the locking member.

It will also be appreciated that the headrest assembly
15 could be attached to a structural part of the vehicle if fitted to a rear seat of a motor vehicle.

CLAIMS

1. A head restraint assembly comprising an attachment means for attaching a head restraint member to a structural part of a motor vehicle, the head restraint member being pivotally connected to a transverse rod forming part of said attachment means for movement between a forward and a rearward position, the head restraint having a padded headrest member covering a support member and a securing means to hold the head restraint during normal use in any position between said forward and rearward positions but being arranged to allow movement of the head restraint towards said forward position under the force of inertia acting on the head restraint member when the vehicle is subject to severe deceleration, the assembly characterised in that the securing means comprises a helical coil locking member engaged with a transverse support rod forming part of said support member, said locking member having an internal diameter that in the relaxed state is less than the diameter of the transverse support rod and having a first end portion for abutment against part of said attachment means and a second end portion extending to form a release lever such that upon rotation of the second end portion in a predetermined direction the internal diameter of the coil locking member is increased so as to reduce the gripping effect on the transverse support rod with

which it is engaged thereby allowing the head restraint member to be rotated relative to the attachment means.

2. A head restraint assembly as claim in Claim 1 in which the structural part of the motor vehicle is a backrest portion of a seat
3. A head restraint assembly as claimed in Claim 2 in which the attachment means comprises of at least one rod for engagement with the backrest portion of the seat to the or each of which is attached at its upper end a bearing member used to pivotally connect the head restraint member to the attachment means.
4. A head restraint assembly as claim in Claim 3 in which the first end of the helical locking means is engaged with an aperture in the bearing member.
5. A head restraint assembly as claimed in Claim 3 in which there are two rods each of which has a bearing member attached thereto.
6. A head restraint assembly as claimed in Claim 5 in which the first end of the helical locking means is engaged with an aperture in one of the bearing members.
7. A head restraint assembly as claim in any preceding Claim in which there are two helical locking means engaged with the transverse support rod to hold the head restraint member in position.

8. A head restraint assembly as claim in Claim 7 in which the two helical locking means are wound in opposite directions.
9. A head restraint assembly as claimed in any preceding Claim in which a spring is interposed between the attachment means and the head restraint member to urge the head restraint in a rearward direction.
10. A head restraint assembly as claimed in any preceding claim in which the support member is a peripheral frame of which the transverse support rod forms part.
11. A head restraint assembly substantially as hereinbefore described with reference to the accompanying drawings.



Application No: GB 9826289.2
Claims searched: 1-11

INVESTOR IN PEOPLE
Examiner: Dr Paul R Minton
Date of search: 25 February 1999

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.Q): A4L (LBEP, LBEQ, LCC); E2F (FAE).
Int Cl (Ed.6): B60N 2/48; E05D 11/00.
Other: -

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	GB 2 106 380 A (BMW). See particularly Figure 3.	
A, P	EP 0 825 061 A2 (TRW). See particularly WPI Abstract Accession No. 97-035615 [04] and Figure 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.