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A4J 23X
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(19)



(54) RESTRAINING MEANS FOR VEHICLE SEATS

(71) We, WINGARD LIMITED, a British Company of Kingsham Road, Chichester, Sussex, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to vehicle seats of the kind in which a seat part is resiliently mounted on a base.

Under normal driving conditions some relative movement between seat part and base is desirable. However in accident conditions, especially when the vehicle experiences rapid deceleration, the inertia forces acting on the seat part may be sufficient to cause the seat part and its occupant to move through an undesirable distance.

According to this invention a vehicle seat of the kind set forth comprises an elongated stay extending between the seat part and the base, the effective length of the stay being variable to accommodate movement of the seat part relative to the base, and locking means for preventing the effective length of the stay from increasing, the locking means being actuated by means responsive to an inertia force.

The base may be part of the vehicle or a base assembly which is adapted to be attached to the vehicle. The seat part may be resiliently mounted on the base by a suspension structure including parallel linkages, hydraulic or pneumatic dampers, torsion bars, springs or the like.

Preferably the stay comprises two relatively movable members, one being provided with ratchet teeth and the other with a locking member adapted to co-operate with the ratchet teeth to prevent the stay extending. The actuating means may be a pivoted inertia member sensitive to a deceleration of the vehicle and adapted to actuate the locking member when the deceleration of the vehicle exceeds a predetermined value.

Two examples of vehicle seats according to our invention are described with refer-

ence to the accompanying drawings in which:—

Figure 1 is a diagrammatic side view of a seat incorporating a telescopic stay,

Figure 2 is a view of the stay in Figure 1 to a larger scale and partially sectioned,

Figure 3 is a detail of Figure 2 showing the stay in a locked position,

Figure 4 is a section on the lines 4—4 of Figure 2,

Figure 5 is a side view of a second embodiment of a telescopic stay in the locked position,

Figure 6 is a section on a larger scale on the lines 6—6 of Figure 5,

Figure 7 is an enlarged detail of the stay in Figure 5 in the unlocked position, and

Figure 8 is a section on the lines 8—8 of Figure 7.

Figure 1 shows a vehicle seat in which a seat part 1 is resiliently mounted on a first base part 2 by means of a suspension structure 3, the base part 2 being longitudinally adjustable relative to the vehicle. One end of a telescopic stay 4 is pivotally attached to each side of the rear of the seat part 1, the other end of the stay 4 being attached to a second base part 5 or bracket fixed to the floor of the vehicle behind the seat.

Figures 2 to 4 show that the inner member 6 of the stay 4 is a substantially flat bar attached to the seat part 1. The lower edge of the bar 6 is formed with ratchet teeth 7 and the upper edge portion of the bar is cranked over so that it can slide in a complementary longitudinal slot in a support 8 of plastics material keyed into the outer member 9 of the stay. The outer member 9 of the stay is U-shaped and mounted with its open side facing downwardly. A locking member 10 in the form of a pawl is pivotally mounted between the side walls of the U-shaped member 9 so that it will engage a ratchet tooth 7 when pivoted upwardly.

The pawl 10 is actuated by two bobweights 11, each in the form of a pear-shaped plate rigidly connected by its narrower end to one of the pawl pivot pins on

[Price 25p]

Price 33p

the outside of the U-shaped member 9 so that the two bob-weights 11 straddle the U-shaped stay member 9.

5 In the unengaged position of the pawl 10 the wider ends of the bob-weights 11 lie to the rear of the pivotal axis of the pawl and the angle between the major axes of the bob-weights 11 and the vertical is chosen so that only a deceleration of the vehicle
10 greater than a predetermined value will cause the bob-weights to pivot forwardly to the vertical position from where they can continue to pivot forwardly under gravity. Thus, for deceleration less than this pre-
15 determined value, the pawl 10 does not interfere with the normal sliding movement of the bar 6 as the seat part 1 moves up and down or is adjusted longitudinally. An adjustable stop can be provided so that the
20 normal rest position of the pawl 10 and bob-weights 11 can be altered. When the pawl plate has been actuated it has to be reset manually.

25 The use of support 8, preferably of an acetel plastics material, reduces the wear caused by the constant relative movement of the two stay members. As shown in Figure 1 a seat belt 12 can be anchored at the pivot point of the stay 4.

30 In the second embodiment of the telescopic stay 4 shown in Figures 5 to 8, the outer stay member 13 is adapted to be pivotally attached to the seat part and the inner stay member 14 is pivotally attached to a second
35 base part or bracket 15. The outer stay member 13 is generally channel section with opposed re-entrant edge portions and mounted so that the base of the channel is vertical. The inner stay member 14 is slid-
40 able within these edge portions and is guided on spaced supports 16 of plastics material such as nylon which can be secured to either stay member. The lower edge portion 17
45 is formed with ratchet teeth 18 which co-operate with a toothed locking member 19. This member 19 is a plate having two central parallel and inclined slots 20 by which it is mounted on two pins 21 extending be-
50 tween the inner stay member 14 and a bent-back end portion 22 of this inner member.

55 The actuating means for the locking member 19 comprise a control rod 23 extending from the locking member down to form a loop 24 around the pivot pin 25 of the inner stay member 14 and an inertia member or striker 26 pivoted to the bracket 15 and adapted to strike the lower end of loop 24 when subjected to a inertia force above a predetermined value.

60 In the normal condition of the stay 4, the locking member 19 is set manually with the lower edge surfaces of the slots 20 in contact with the pins 21 so that the teeth on the locking member 19 are clear of the

65 teeth 18 and the lower end of the loop 24 in the control rod 23 is clear of the pivot 25. When the vehicle experiences a deceleration greater than the predetermined value, the inertia of the striker 26 swings it forwardly to strike the control rod 23. Move-
70 ment of the control rod 23 causes the locking member 19 to ride outwardly of the pins 21 into engagement with the ratchet teeth 18 so preventing further extension of the stay 4.

75 It will be appreciated that the actuating means could be arranged to be made responsive to an acceleration or angular movement of the vehicle in any direction though for normal purposes sensitivity to a deceleration
80 in the normal direction of vehicle travel is sufficient.

WHAT WE CLAIM IS:—

85 1. A vehicle seat of the kind set forth comprising an elongated stay extending between the seat part and the base, the effective length of the stay being variable to accommodate movement of the seat part relative to the base, and locking means for preventing the effective length of the stay from increasing, the locking means being actuated
90 by means responsive to an inertia force.

95 2. A vehicle seat as claimed in claim 1 in which the stay comprises two relatively movable members, one being provided with ratchet teeth and the second with a locking member adapted to co-operate with the ratchet teeth to prevent the stay extending.

100 3. A vehicle seat as claimed in claim 2 in which the actuating means comprises a pivoted inertia member sensitive to a deceleration of the vehicle and adapted to actuate the locking member when the deceleration of the vehicle exceeds a predetermined value.

105 4. A vehicle seat as claimed in claim 3 in which the locking member is a pawl pivotally mounted on the second stay member and connected to a bob-weight adapted to bring the pawl into engagement with the ratchet teeth.

115 5. A vehicle seat as claimed in claim 3 in which the locking member is a toothed plate having a pin and slot connection with the second stay member and the actuating means comprise a control rod attached to the plate, and a pivoted striker adapted to strike the control rod and to move the
120 toothed plate into engagement with the ratchet teeth.

125 6. A vehicle seat as claimed in any one of the preceding claims in which the stay is telescopic.

7. A vehicle seat as claimed in claim 6 in which plastics material is interposed between the inner and outer stay members.

the outside of the U-shaped member 9 so that the two bob-weights 11 straddle the U-shaped stay member 9.

In the unengaged position of the pawl 10 the wider ends of the bob-weights 11 lie to the rear of the pivotal axis of the pawl and the angle between the major axes of the bob-weights 11 and the vertical is chosen so that only a deceleration of the vehicle greater than a predetermined value will cause the bob-weights to pivot forwardly to the vertical position from where they can continue to pivot forwardly under gravity. Thus, for deceleration less than this predetermined value, the pawl 10 does not interfere with the normal sliding movement of the bar 6 as the seat part 1 moves up and down or is adjusted longitudinally. An adjustable stop can be provided so that the normal rest position of the pawl 10 and bob-weights 11 can be altered. When the pawl plate has been actuated it has to be reset manually.

The use of support 8, preferably of an acetal plastics material, reduces the wear caused by the constant relative movement of the two stay members. As shown in Figure 1 a seat belt 12 can be anchored at the pivot point of the stay 4.

In the second embodiment of the telescopic stay 4 shown in Figures 5 to 8, the outer stay member 13 is adapted to be pivotally attached to the seat part and the inner stay member 14 is pivotally attached to a second base part or bracket 15. The outer stay member 13 is generally channel section with opposed re-entrant edge portions and mounted so that the base of the channel is vertical. The inner stay member 14 is slidable within these edge portions and is guided on spaced supports 16 of plastics material such as nylon which can be secured to either stay member. The lower edge portion 17 is formed with ratchet teeth 18 which co-operate with a toothed locking member 19. This member 19 is a plate having two central parallel and inclined slots 20 by which it is mounted on two pins 21 extending between the inner stay member 14 and a bent-back end portion 22 of this inner member.

The actuating means for the locking member 19 comprise a control rod 23 extending from the locking member down to form a loop 24 around the pivot pin 25 of the inner stay member 14 and an inertia member or striker 26 pivoted to the bracket 15 and adapted to strike the lower end of loop 24 when subjected to a inertia force above a predetermined value.

In the normal condition of the stay 4, the locking member 19 is set manually with the lower edge surfaces of the slots 20 in contact with the pins 21 so that the teeth on the locking member 19 are clear of the

teeth 18 and the lower end of the loop 24 in the control rod 23 is clear of the pivot 25. When the vehicle experiences a deceleration greater than the predetermined value, the inertia of the striker 26 swings it forwardly to strike the control rod 23. Movement of the control rod 23 causes the locking member 19 to ride outwardly of the pins 21 into engagement with the ratchet teeth 18 so preventing further extension of the stay 4.

It will be appreciated that the actuating means could be arranged to be made responsive to an acceleration or angular movement of the vehicle in any direction though for normal purposes sensitivity to a deceleration in the normal direction of vehicle travel is sufficient.

WHAT WE CLAIM IS:—

1. A vehicle seat of the kind set forth comprising an elongated stay extending between the seat part and the base, the effective length of the stay being variable to accommodate movement of the seat part relative to the base, and locking means for preventing the effective length of the stay from increasing, the locking means being actuated by means responsive to an inertia force.

2. A vehicle seat as claimed in claim 1 in which the stay comprises two relatively movable members, one being provided with ratchet teeth and the second with a locking member adapted to co-operate with the ratchet teeth to prevent the stay extending.

3. A vehicle seat as claimed in claim 2 in which the actuating means comprises a pivoted inertia member sensitive to a deceleration of the vehicle and adapted to actuate the locking member when the deceleration of the vehicle exceeds a predetermined value.

4. A vehicle seat as claimed in claim 3 in which the locking member is a pawl pivotally mounted on the second stay member and connected to a bob-weight adapted to bring the pawl into engagement with the ratchet teeth.

5. A vehicle seat as claimed in claim 3 in which the locking member is a toothed plate having a pin and slot connection with the second stay member and the actuating means comprise a control rod attached to the plate, and a pivoted striker adapted to strike the control rod and to move the toothed plate into engagement with the ratchet teeth.

6. A vehicle seat as claimed in any one of the preceding claims in which the stay is telescopic.

7. A vehicle seat as claimed in claim 6 in which plastics material is interposed between the inner and outer stay members.



8. A vehicle seat substantially as described with reference to Figures 1 to 4 of the accompanying drawings.

9. A vehicle seat substantially as described with reference to Figures 5 to 8 of the accompanying drawings.

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