

[54] **NECK SUPPORT**

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297/408, 410; 248/412, 414

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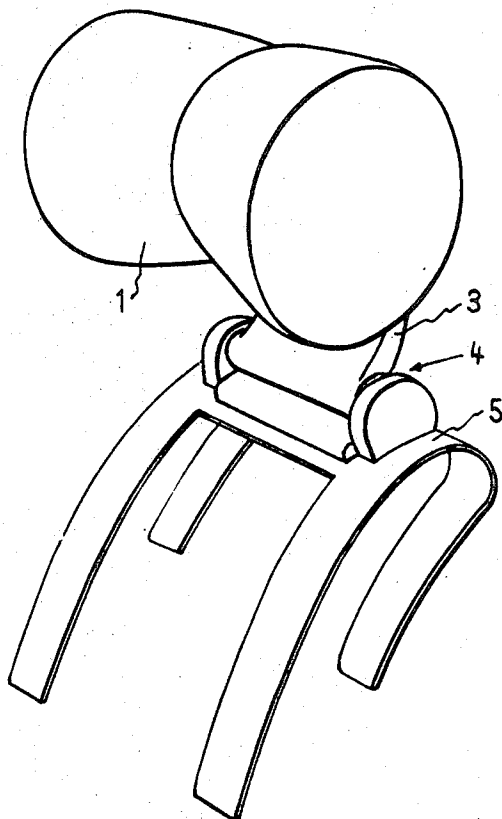
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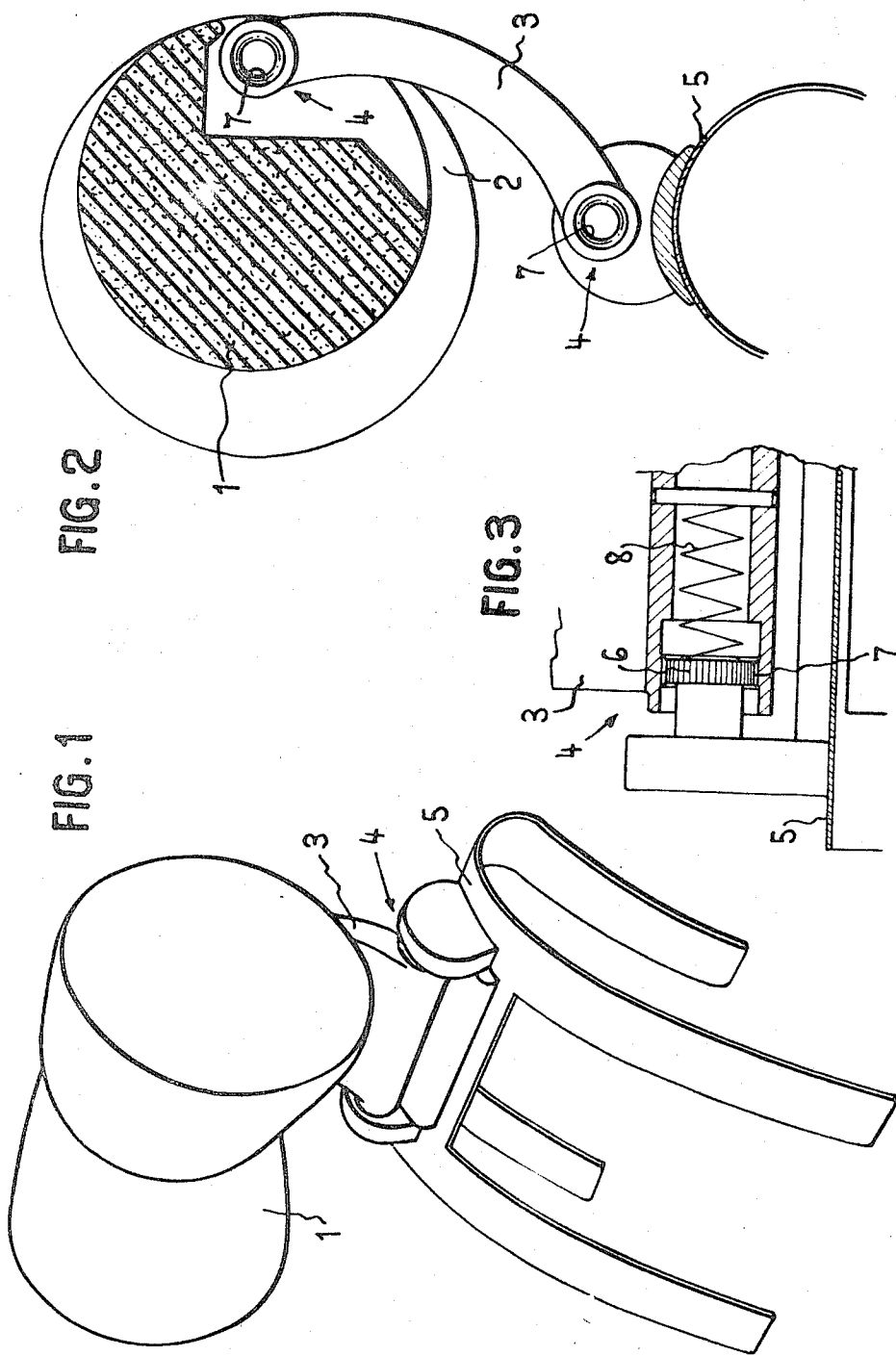
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ABSTRACT

This invention relates to a neck support for car seats having a support roll in form of a support cushion, a lever and a fixing device, said lever being connected by stop devices as well to the cushion as to the fixing device, which is fixed in such a manner to the back rest of the car seat, that it can be brought and secured in several positions relatively to the back rest, in which said stop devices which connect the cushion to the lever are at least almost identical to those which connect said lever to the fixing device.

4 Claims, 3 Drawing Figures





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NECK SUPPORT

This invention relates to a neck support for car seats, having a support roll formed of a support cushion, which is fixed in such a manner to the back rest of the car seat, that it can be brought and secured in several positions relatively to the back rest.

Neck supports having an adjusting mechanism intercepted between the support cushion and the means for fixing it to the back rest, are well known in the art. But all of them are either not stable enough or present a very much complicated adjusting mechanism or are difficult to adjust. Moreover many of them do not correspond to the security prescriptions.

It is one object of the present invention, to realize a neck support of a simple construction presenting a sufficient mechanical stability.

Another object of this invention is a neck support which can easily be adjusted.

A further object of this invention is a neck support which can be used in all types of car.

All these objects can be achieved by a neck support having the support cushion connected to a lever by stop devices, said lever being connected to a fixing device, for fixing the neck support to the back rest of the car seat, by at least almost identical stop devices. An advantageous embodiment of the neck support of this invention has stop devices which are spring-loaded and can be released by axial pressure.

The advantages of the neck support according to this invention lie particularly in the fact, that it is very safe without having a complicated adjusting mechanism or presenting any difficulties to adjust. The mechanical stability of the neck support is extremely high although the construction is simple.

The invention will be understood easily in connection with the drawing in which

FIG. 1 shows a perspective view of a possible embodiment,

FIG. 2 a cross-section of the embodiment of FIG. 1 and

FIG. 3 a detail of the stop device in a cross-sectional view.

FIG. 1 shows two truncated cones which are put together to form a support cushion 1, which is connected to a lever 3 by stop devices 4 (FIG. 2). The lever 3 itself is connected to a fixing device 5, by stop devices 4 which are at least almost identical to the above mentioned one, which will be described more in detail. The back rest of the car seat on which the neck support is fixed, is not represented, because it can have every possible shape.

FIG. 2 shows a stop device 4 inside of the generated surface 2 of the support cushion 1, said stop device 4 connecting the cushion 1 to a lever 3, which is on its other end connected to a fixing device 5 by another stop device 4. As represented in FIG. 1, the fixing device 5 can be formed of clamp springs or any other suitable means. If clamp springs are used, it is recommendable to secure them by securing strips to the back rest.

FIG. 3 shows the construction of the stop devices 4 in a cross-sectional view. In particular there is shown one of the stop devices 4, connecting the lever 3 to the fixing device 5. The other one is exactly symmetrically. A toothed wheel 6 is rigidly connected to the fixing device 5 and engages with an inner toothed rim 7 of a collar which is a part of the lever 3. Due to the fact that

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the collar presents, due to its symmetry, two rims 7 which of course engage each with a wheel 6, the neck support can not be turned around a vertical axis. The toothed rim 7 has a width which is just a bit larger than the width of the toothed wheel 6. To keep the wheels 6 in gear with the rims 7, two springs 8, from whose only one is represented, act on the wheels 6. These springs 8 are calculated in such a manner that the collar, which is a part of the lever 3, is in its condition of equilibrium, when it is in the position shown in FIG. 3, that means when the wheels 6 are in gear with the rims 7. In this case, the position of the lever 3 cannot be changed, so that the lever 3 is secured. To give enough mechanical stability to the stop device 4, so that it is safe and corresponds to the requirements of security, it is important to choose dimensions for all elements (wheel 6 and rim 7), which depend of the materials used and forces expected, acting thereon in case of a crash.

To adjust the neck support, respectively the support cushion 1, in the horizontal direction, the lever 3 has to be displaced in such a manner, that the wheels 6 disengage the rims 7. To do this, an axial force is needed, which is important enough, to overcome the forces of the two springs 8. Once the wheels 6 are disengaged from the rims 7, the lever 3 can be brought in almost any position wanted relative to the fixing device 5, where the mentioned axial force is released so that the lever 3 takes again its equilibrium state in which the wheels 6 mesh with the rims 7. Now the lever 3 is secured again and cannot be displaced involuntarily.

As mentioned above, the stop devices 4, which are located inside the generated surface 2 of the support cushion 1, are at least almost identical to those located between the lever 3 and the fixing device 5. The only difference between these and those devices 4 is, that the toothed wheels 6 are rigidly connected to the support cushion 1 and not to the fixing device 5. The connection between the wheels 6 and the cushion 1 can be achieved by any suitable mean, as it is well known in the art.

Since the devices 4, which are located between the cushion 1 and the lever 3, correspond in their construction to those located between the lever 3 and the fixing device 5, the adjustment of the position of the cushion 1 can be achieved in a way analogous to that described in connection with the adjustment of the position of the lever 3.

In spite of the fact that the swivel axis, in form of the stop devices 4, is of a very simple construction, it is possible to adjust the neck support, respectively the support cushion 1 in a very large scale. It should be noted, that all stop devices 4 are of that type, a fact which is very much important, if an economic manufacture of the neck support is envisaged.

According to the embodiment of a neck support shown in the drawing, it is obvious, that the horizontal adjustment of the cushion 1 can be achieved by adjusting the position of the lever 3 relatively to the fixing device 5. The vertical adjustment of the cushion 1 can be achieved by adjusting the position of the cushion 1, relatively to the lever 3, because of the fact, that the swiveling axis of the cushion 1 is very much eccentric relative to the central axis of the cushion 1.

It is obvious that both, the vertical and horizontal adjustment of the neck support can be done at the same moment, if the axial force applied to the cushion 1 is

strong enough to disengage all toothed rims 7 from the wheels 6.

Partial modifications of the shown embodiment can be realized without departing from the initial concept of the neck support. So it is possible to use a support cushion having a different shape, e.g., a square or a rectangular shape. The only important point is, that the swiveling axis is decentered from the geometrical axis, so that the cushion can be adjusted in a large range.

Other fixing devices e.g., in form of clamping devices, which are controlled by clamping levers or hand wheels, can also be used, as well as other stop devices.

We claim:

1. A safety neck support for car seats comprising a support cushion, a supporting lever and a fixing device for connecting the neck support to the back rest of the car seat, said lever being pivotably mounted in said support cushion by means of first pivot means and in said fixing devices by means of second pivot means, each of said first and second pivot means comprising lock means preventing relative rotation of said cushion on said lever and of said lever on said fixing device respectively, said lock means being engaged by spring force and being disengageable by pressure on said cushion and lever respectively in the direction of the axis of said first and second pivot means, and said lock means having symmetrical characteristics such that they are disengageable by axial pressure in both directions, it being possible to simultaneously disengage both lock means by axial pressure against said cushion for horizontal and vertical adjustment of the cushion by swivelling the cushion relatively to said lever and by swivelling said

lever relatively to said fixing device.

2. A safety neck support according to claim 1, wherein each of said first and second pivot means has a shaft with a toothed portion near each of its ends, each of said toothed portions engaging a toothed portion of a pivot member when said shaft and pivot member are maintained in a rest position by said spring force, and said toothed portions being axially disengaged thereby allowing relative rotation of said shaft and said pivot members by axial forces acting between said shaft and said pivot members.

3. A safety neck support according to claim 2, wherein said shaft is a hollow shaft having an internal toothing while said pivot members engage into the ends of said hollow shaft and are provided each with an external toothing, said internal toothing of the hollow shaft and said external toothing of the pivot members engaging each other in a rest position of said hollow shaft determined by springs acting each between one of said pivot members and an abutment in said hollow shaft.

4. A safety neck support according to claim 1, wherein said cushion is of substantially circular cross section, said first pivot means being located near the circumference of said cushion such that substantially vertical adjustment of the cushion is obtained by pivoting it round said first pivot means but the shape of the portion of the cushion supporting the head being substantially independent of the vertical position of the cushion.

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