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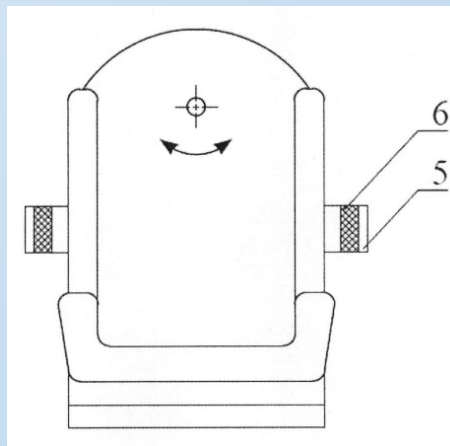
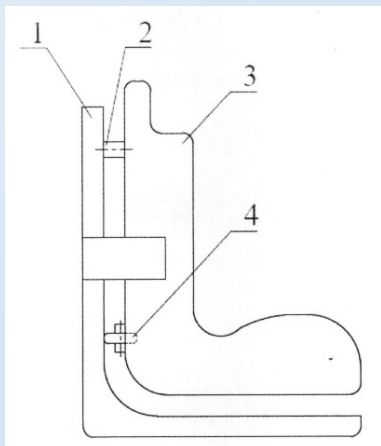
Offer № 009UM

Tilting pendulum type child car seat

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A tilting swing-type child car seat designed to both ensure the passive safety of children traveling in a car and to improve their comfort has been developed at Technical University of Sofia, for which a utility model has been issued in Bulgaria.

Application № 5049



The principle of tilting in road curves has been studied and applied in railway transport. In road transport, there have been experimental developments of car body tilting systems, but they have not caught on, as their influence on the vehicle stability has not yet been well studied. Therefore, there are active systems for tilting the seats, in which the information received from the sensors for the speed of the car, the angle of rotation of the steering wheel, etc. serves to form a control signal to a drive that tilts the seat at a certain angle. Because the system is active and requires many components, it has not been widely used.

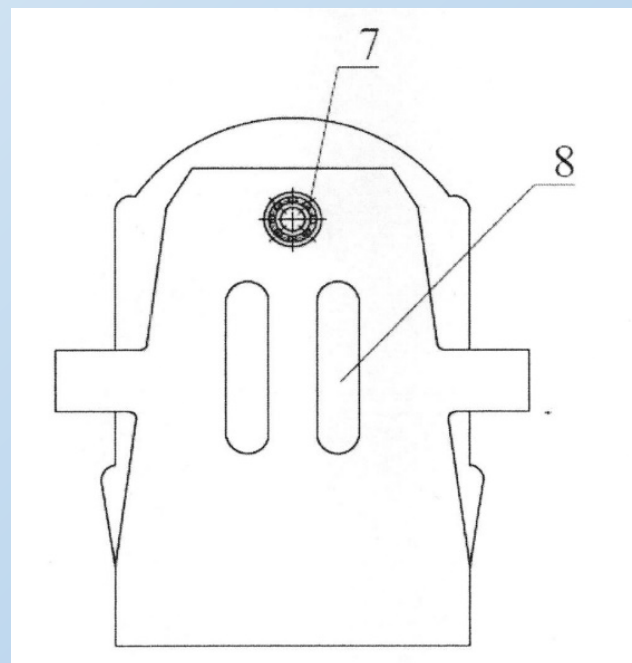
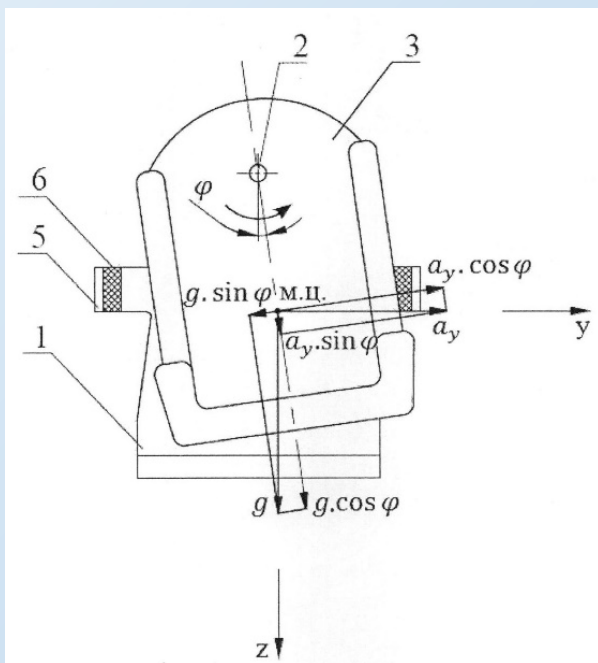
Technical solution

The task of the useful model is to offer a tilting child seat with passive action, for the operation of which no external energy sources, sensors and actuators are required, which ensures the safety and improves the comfort of the child. The tilting car child seat of the pendulum type consists of a child seat 3, which at the upper end of the backrest has an axis of a cylindrical joint 2 fixed, through which the seat 3 is attached to a supporting base 1, in which a rolling bearing 7 is mounted, in which the axis of the joint 2 bears. The axis of the cylindrical joint 2 is located above the centre of mass of the child sitting in the seat. On both sides of the base 1, there are stops 5 with elastic buffers 6, limiting the two extreme positions of tilting of the child seat 3. Thus, the assembled seat is mounted on the back seat of the car. The proposed seat improves comfort because when cornering the centrifugal force tilts the seat and the lateral acceleration acting on the child is less than the lateral acceleration acting on the vehicle and passengers.

Application and advantages

The tilting of the car child seat in a turn is done by turning around the cylindrical joint located above the centre of mass of the seat and the child sitting in it. When the car turns, the centrifugal force acts at the child's centre of mass and causes the seat and the sitting child to tilt around the axis of the cylindrical joint 2 at an angle φ in the direction of the centre of the turn. The transverse accelerations acting on the child traveling in the car decrease because the acceleration a_y is decomposed into two components. The component $a_y \cdot \cos \varphi$ acts in the transverse direction, and the component $a_y \cdot \sin \varphi$ in the vertical direction relative to the child sitting in seat 3. When tilting the seat 3, the gravitational acceleration g also decomposes into two components. One is $g \cdot \cos \varphi$, which is vertical for the child sitting in seat 3, and the other $g \cdot \sin \varphi$, which is in the transverse direction and has a direction opposite to the direction of the transverse acceleration caused by the car turning. Then the resultant acceleration acting in the transverse direction of the traveling child will be: $a_{res} = a_y \cdot \cos \varphi - g \cdot \sin \varphi$. In this way, tilting helps reduce the incidence of travel sickness, which has already been proven in research on tilting cars used in rail transport.

Technological images



Contact for this offer



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