CLAIMS

1. An elevator comprising

a hoistway;

an elevator car vertically movable in the hoistway;

a plurality of ropes connected to the car;

a rotatable traction member comprising a circumferential traction surface area for each of the several ropes;

each rope being arranged to pass around the rotatable traction member resting against a circumferential traction surface area of the traction member;

a drive machinery for controlling rotation of the rotatable traction member;

characterized in that the elevator comprises means for detecting displacement of each of the ropes over a first limit position in the first axial direction of the rotatable traction member, and over a second limit position in the second axial direction of the traction member; and in that

displacement of one or more of said ropes in axial direction of the rotatable traction member over the first or second limit position is arranged to trigger the drive machinery to stop the rotation of the rotatable traction member.

2. An elevator according to claim 1, **wherein** the ropes are in the form of belts.

3. An elevator according to any of the preceding claims, **wherein** said stopping of the rotation of the rotatable traction member includes braking rotation of the rotatable drive member with mechanical brake(s) of the elevator and/or stopping the motor from rotating the rotatable traction member.

4. An elevator according to any of the preceding claims, **wherein** the elevator comprises a safety circuit breaking of which is arranged to cause the drive machinery to brake rotation of the traction member with mechanical brake(s) of the elevator and/or to stop the motor from rotating the rotatable traction member, and displacement of one or more of said ropes in axial direction of the traction member over the first or second limit position is arranged to trigger the drive machinery to brake rotation of the rotatable traction member with mechanical brake(s) of the elevator and/or to stop the motor from rotating the rotatable traction member by triggering a series of one or more actions including at least breaking of the safety circuit.

5. An elevator according to any of the preceding claims, **wherein** said means for detecting displacement of each of said ropes comprise on opposite sides of each of said ropes in said axial direction of the traction member a first and a second sensing member, the first sensing member being positioned at the first limit position of the rope in question and the second sensing member being positioned at the second limit position of the rope in question, each sensing member being displaceable by the rope, which is displaced in said axial direction to collide into contact with the sensing member, and displacement of each sensing member being arranged to trigger the drive machinery stop the rotation of the traction member.

6. An elevator according to claim 5, **wherein** each of said sensing members is displaceable at least in the longitudinal direction of the rope, whereby the rope, when it moves in its longitudinal direction during elevator use and is displaced in said axial direction to collide into contact with the sensing member, is arranged to engage the sensing member and push and displace it at least in the longitudinal direction of the rope.

7. An elevator according to claim 5 or 6, **wherein** each of said sensing members is mounted pivotally displaceably around an axis parallel with the axial direction of the traction member, pivoting displacement of each sensing member being arranged to trigger the drive machinery to stop the rotation of the traction member.

8. An elevator according to any of claims 5 to 7, **wherein** said sensing members are mounted displaceably via a common displaceable carrier body.

9. An elevator according to claim 8, **wherein** said means for detecting displacement of each of said ropes comprise at least one electrical sensor arranged to sense position of the displaceable carrier body, and displacement of the carrier body, in particular pivoting thereof, is arranged to trigger the drive machinery to stop the rotation of the traction member.

10. An elevator according to any of the preceding claims, **wherein** said circumferential traction surface areas have each a surface roughness or a surface texture substantially different from the surface roughness or the surface texture of the circumferential surface areas of the traction member next to it in said axial direction of the traction member, and said means for detecting displacement of each of said ropes comprise a sensing arrangement comprising one or more sensors for sensing sound and/or a vibration, which sensing arrangement is arranged to trigger the drive machinery to stop the rotation of the traction member if the sound and/or vibration sensed by the sensing arrangement meet predetermined criteria, such as reaches a predetermined limit or changes in a predetermined way.

11. An elevator according to any of the preceding claims, **wherein** said means for detecting displacement of each of said ropes comprise one or

more sensing devices for receiving ultrasonic sound or electromagnetic radiation from said limit positions, and a monitoring unit connected to the one or more sensing devices and arranged to trigger the drive machinery to stop the rotation of the traction member if ultrasonic sound or electromagnetic radiation received from one or more of said limit positions meets predetermined criteria.

12. An elevator according to claim 11, **wherein** each of the one or more sensing devices comprises a receiver for receiving ultrasonic sound or electromagnetic radiation from the limit position(s) it is associated with.

13. An elevator according to any of the preceding claims, **wherein** the ropes pass around the rotatable traction member adjacent each other in axial direction of the rotatable traction member as well as in the width-direction of the ropes, the wide sides of the ropes against the traction member.

14. An elevator according to any of the preceding claims, **wherein** the rotatable traction member is a traction wheel.

15. An elevator according to any of the preceding claims, **wherein** each circumferential traction surface area of the rotatable traction member has an individual crowning shape.

16. An elevator according to any of the preceding claims, **wherein** the drive machinery for controlling rotation of the rotatable traction member comprises a motor for rotating the rotatable traction member, and a control unit for controlling the motor, and/or a mechanical brake for braking rotation of said rotatable traction member.