Lift installation

The present invention relates to a lift installation with a monitoring device for a support means and to a method of determining a state of a support means in a lift installation.

In lift installations steel cables were conventionally used as support means for supporting and/or driving a lift cage. According to a development of such steel cables belt-like support means comprising tensile carriers and a casing arranged around the tensile carriers are also used. However, such belt-like support means cannot be monitored in conventional manner, because the tensile carriers, which determine a breakage load of the support means, are not visible through the casing.

For the monitoring of such tensile carriers in belt-like support means a test current can be applied to the tensile carriers. A current flow or an amperage, a voltage, an electrical resistance or an electrical conductivity is measured in the thus-formed current circuit or in several thus-formed current circuits. A conclusion about the intact state or degree of wear of the support means can be made on the basis of a variable measured in that way. If, in particular, the diameter of a tensile carrier reduces due to breakage of individual wires or due to metallic abrasion the electrical resistance of this tensile carrier increases.

Published specification DE 3934654 A1 discloses, for example, a serial connection of all individual tensile carriers and an ammeter, wherein it is checked whether an electric current flows through the tensile carriers connected in series. It can thereby be established whether one of the tensile carriers is interrupted at some point.

Patent US 7123030 B2 discloses calculation of an electrical resistance by measurement of an instantaneous voltage by means of a Kelvin bridge and comparison of the thus-determined voltage value with an input reference value.

Publication WO2005/094250 A2 discloses temperature-dependent measurement of electrical resistance or electrical conductivity, in which different environmental and thus also presumed support-means temperatures are taken into account, which can be very different particularly in high lift shafts.

WO 2003/059798 A2 discloses a belt-like support means for lift installations. In that case, a

LIFT SYSTEM WITH MONITORING DEVICE AND METHOD FOR MONITORING A LIFT SYSTEM

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