Fire service lift

The present invention relates to an extinguishing water discharge system for a lift installation in which a lift cage is moved in a shaft. The present invention relates particularly to the design of the lift cage.

Modern lift installations or so-called fire service lifts which are designed especially for this purpose must guarantee reliable operation even in the event of fire. On the one hand the evacuation of persons and/or vulnerable material from the storeys affected by the fire must be guaranteed and on the other hand a functionally capable lift also has to be available for the transport of fire service personnel and their extinguishing material. In either case the use of extinguishing water should not have the consequence that the lift installation or the fire service lift no longer functions. This applies not only to the use of a sprinkler installation on a storey, but also to the use of extinguishing water by the fire service.

This means that electrical components of the lift installation have to remain dry. In addition, it has to be ensured that a support means on a drive pulley is still driven as desired. Extinguishing water can in that case have a negative influence on the traction of the support means on the drive pulley. On the one hand extinguishing water can directly reduce the coefficients of friction between the drive pulley and the support means and on the other hand lubricant present in the extinguishing water can additionally negatively influence the traction between support means and drive pulley. A support means wetted by extinguishing water can thus lead to reduction in traction or even to complete loss of traction. In the case of, in particular, a substantial difference between the weight of the lift cage and of a counterweight an uncontrolled travel of the lift cage can then arise, which has to be stopped by safety brakes. Faultless functioning of the safety brake or the braking retardation of the brake shoes thereof on guide rails can, however, also not be guaranteed if the brake shoes of the guide rails are moistened by extinguishing water.

The use of belt-like support means instead of steel cables has the problem of a heightened loss of traction between support means and drive pulley. The synthetic material surfaces of belt-like drive means change their traction properties in the case of wetting by extinguishing water more strongly than steel-cable-like support means. This makes it necessary to conduct away or collect the extinguishing water in controlled

Patent claims

1. Fire service lift with a lift cage (1) comprising a cage roof (15), wherein the lift cage (1) is at least partly supported and driven by at least one support means (3), characterised in that the lift cage (1) has on the cage roof (15) a region (16) vulnerable to spray water and that this region (16) vulnerable to spray water is covered by an element (19, 20) having a surface structure of such a kind that extinguishing water (14) falling on the element (19, 20) in the case of fire is substantially prevented from spraying in the direction of the at least one support means (3).

2. Fire service lift according to claim 1, wherein the element (19, 20) is constructed as porous material (19).

3. Fire service lift according to claim 2, wherein pores of the porous material (19) have a diameter of less than 2 centimetres, preferably less than 1 centimetres, particularly preferably less than 0.5 centimetres.

4. Fire service lift according to claim 2 or 3, wherein the porous material (19) contains a porous foam material.

5. Fire service lift according to any one of claims 2 to 5, wherein the porous material is fire-resistant.

6. Fire service lift according to claims 2 to 5, wherein the porous material (19) has a thickness (21) of at least 1 centimetre, preferably at least 3 centimetres, particularly preferably 5 centimetres.

7. Fire service lift according to claim 1, wherein the element (19, 20) is constructed as a grate-like element (20).

8. Fire service lift according to claim 7, wherein the grate-like element (20) has longitudinal elements (26) so arranged that they are disposed substantially perpendicularly to a plane of cage doors (4).

9. Fire service lift according to claim 8, wherein the longitudinal elements (26) are at least 3 centimetres, preferably at least 5 centimetres, particularly preferably 10 centimetres, high.

10. Fire service lift according to any one of claims 7 to 9, wherein transverse elements (27) are so connected with the longitudinal elements (26) that the transverse elements (27) are arranged substantially perpendicularly to the longitudinal elements (26).

11. Fire service lift according to claim 10, wherein the transverse elements (27) have openings (28).

12. Fire service lift according to any one of the preceding claims, wherein the region (16) vulnerable to spray water has a length (17) and a width (18) and is disposed at a side edge of the cage roof (15) arranged closest to the cage doors (4).

13. Fire service lift according to claim 12, wherein the width (18) of the region (16) vulnerable to spray water is at least 1 metre and wherein the length (17) of the region (16) vulnerable to spray water is at least as large as a passage width of the opened cage doors (4).

14. Fire service lift according to any one of the preceding claims, wherein the element (19, 20) is arranged on a watertight surface so that the extinguishing water can flow from the element (19, 20) over this watertight surface to edges of the cage roof (15) and from there to cage walls (29, 30) and/or to the cage doors (4).

15. Fire service lift according to any one of the preceding claims, wherein walls (23, 24) protruding beyond the element (19, 20) are arranged in prolongations of cage side walls (30).

FIRE-FIGHTING LIFT

The present invention relates to an extinguishing water discharge system for a lift installation in which a lift cage is moved in a shaft. The present invention relates particularly to the design of the lift cage.

Modern lift installations or so-called fire service lifts which are designed especially for this purpose must guarantee reliable operation even in the event of fire. On the one hand the evacuation of persons and/or vulnerable material from the storeys affected by the fire must be guaranteed and on the other hand a functionally capable lift also has to be available for the transport of fire service personnel and their extinguishing material. In either case the use of extinguishing water should not have the consequence that the lift installation or the fire service lift no longer functions. This applies not only to the use of a sprinkler installation on a storey, but also to the use of extinguishing water by the fire service.

This means that electrical components of the lift installation have to remain dry. In addition, it has to be ensured that a support means on a drive pulley is still driven as desired. Extinguishing water can in that case have a negative influence on the traction of the support means on the drive pulley. On the one hand extinguishing water can directly reduce the coefficients of friction between the drive pulley and the support means and on the other hand lubricant present in the extinguishing water can additionally negatively influence the traction between support means and drive pulley. A support means wetted by extinguishing water can thus lead to reduction in traction or even to complete loss of traction. In the case of, in particular, a substantial difference between the weight of the lift cage and of a counterweight an uncontrolled travel of the lift cage can then arise, which has to be stopped by safety brakes. Faultless functioning of the safety brake or the braking retardation of the brake shoes thereof on guide rails can, however, also not be guaranteed if the brake shoes of the guide rails are moistened by extinguishing water.

The use of belt-like support means instead of steel cables has the problem of a heightened loss of traction between support means and drive pulley. The synthetic material surfaces of belt-like drive means change their traction properties in the case of wetting by extinguishing water more strongly than steel-cable-like support means. This makes it necessary to conduct away or collect the extinguishing water in controlled

Claims

1. Fire service elevator comprising:

an elevator cage with a cage roof, the cage roof having an exterior surface, the elevator cage being at least partly supported and driven by at least one support in an elevator shaft, the elevator cage having on the cage roof a first region external to the elevator cage facing upward and exposed to the elevator shaft above the elevator cage and a second region external to the elevator cage and facing upward;

a spray-inhibiting element covering the second region of the cage roof and positioned to be substantially parallel to the cage roof such that a major surface of the element is in direct contact with the exterior surface of the cage roof, the spray-inhibiting element having a surface structure that substantially allows extinguishing water in the shaft falling on the spray-inhibiting element in event of a fire to penetrate at least partly into the spray-inhibiting element and prevent the extinguishing water from spraying toward the at least one support.

2. Fire service elevator according to claim 1, the element being constructed as porous material.

3. Fire service elevator according to claim 2, the porous material having a plurality of pores of a diameter of less than 2 centimeters.

4. Fire service elevator according to claim 2, the porous material having

a plurality of pores of a diameter of less than 1 centimeter.

5. Fire service elevator according to claim 2, the porous material having a plurality of pores of a diameter of less than 0.5 centimeters.

6. Fire service elevator according to claim 2, the porous material containing a porous foam material.

7. Fire service elevator according to claim 2, the porous material being fire resistant.

8. Fire service elevator according to claim 2, the porous material having a thickness of at least 1 centimeter.

9. Fire service elevator according to claim 1, the element being constructed as a grate-like element.

10. Fire service elevator according to claim 9, the grate-like element comprising longitudinal elements so arranged that they are disposed substantially perpendicular to a plane of cage doors.

11. Fire service elevator according to claim 10, the longitudinal elements being at least 3 centimeters high.

12. Fire service elevator according to claim 10, transverse elements being so connected with the longitudinal elements that the transverse elements are arranged substantially perpendicularly to the longitudinal elements.

13. Fire service elevator according to claim 12, the transverse elements comprising openings.

14. Fire service elevator according to claim 1, the region external to the elevator cage being vulnerable to spray having a length and a width and being disposed at a side edge of the cage roof arranged closest to cage doors of the cage.

15. Fire service elevator according to claim 14, the width of the region vulnerable to spray water being at least 1 meter and the length of the region vulnerable to spray water being at least as large as a passage width of the cage doors when opened.

16. Fire service elevator according to claim 1, the element being arranged on a watertight surface so that the extinguishing water can flow from the element over the watertight surface to edges of the cage roof and from there to cage walls or to cage doors.

17. Fire service elevator according to claim 1, further comprising walls protruding beyond the element, the walls being arranged in prolongations of cage side walls.

18. An elevator cage having a cage door side, opposing side walls and a back wall, comprising:

a cage roof having an upwardly facing region exposed to an elevator shaft above the elevator cage when the elevator cage is in the elevator shaft, the cage roof region extending from the cage door side to the back wall and from one side wall to an opposing side wall: and

a spray-inhibiting element extending from the car door side and covering a portion of the cage roof region less than the cage roof region and external to the elevator cage for preventing extinguishing water in the elevator shaft from spraying from the element toward a support of the elevator cage;

wherein the spray-inhibiting element is positioned to be parallel to the cage roof and wherein the spray-inhibiting element has a surface structure that allows extinguishing water falling on the spray-inhibiting element to penetrate at least partly into the spray-inhibiting element.

19. The elevator cage of claim 18, the spray-inhibiting element comprising at least one porous material.

20. The elevator cage of claim 18, the spray-inhibiting element comprising a grate.