CLAIMS

1. Travelling cable (T) of an elevator, more particularly of a passenger transport elevator and/or freight transport elevator, which travelling cable comprises a protective envelope (9), conductors (7, 8) for transmitting electrical energy and data between the elevator car (1) and the elevator hoistway (S), and one or more load-bearing bearer parts (10) of essentially the length of the travelling cable for fixing the travelling cable (T) at its first end to the elevator car (1) and at its second end to the elevator hoistway (S), **characterized** in that the bearer part (10) is of composite structure and comprises glass reinforcing fibers and/or aramid reinforcing fibers and/or carbon reinforcing fibers and/or polybenzoxazole reinforcing fibers and/or polyethylene reinforcing fibers and/or nylon reinforcing fibers in a polymer matrix material and the reinforcing fibers of the bearer part (10) are a unidirectional reinforcement in the longitudinal direction of the bearer part (10).

2. Travelling cable (T) according to the preceding claim, **characterized** in that the cross-section of the aforementioned bearer part (10) is essentially a conic section or of rectangular shape, in which case preferably the width of the cross-section is greater than the thickness.

3. Travelling cable (T) according to any of the preceding claims, **characterized** in that the polymer matrix material of the aforementioned bearer part (10) is of non-elastomer and the modulus of elasticity of the matrix material is at least 1.5 GPa.

4. Travelling cable (T) according to any of the preceding claims, **characterized** in that the density of the reinforcing fibers of the aforementioned bearer part (10) is less than 4000 kg/m3 and/or the tensile strength of the aforementioned reinforcing fibers is over 1500 N/mm2.

5. Travelling cable (T) according to any of the preceding claims, **characterized** in that the reinforcing fibers of the aforementioned bearer part (10) are carbon fibers, glass fibers, aramid fibers or polymer fibers, or a number of different types of fibers, comprising at least one or more of the aforementioned fibers.

6. Travelling cable (T) according to any of the preceding claims, **characterized** in that the aforementioned bearer part (10) comprises one or more optical fibers (O), more preferably a fiber bundle, disposed inside, or essentially in the proximity of the surface of, the composite structure of the bearer part (10).

7. Travelling cable (T) according to any of the preceding claims, **characterized** in that the aforementioned bearer part (10) comprises one or more optical fibers (O), more preferably a fiber bundle, which fiber or fiber bundle goes inside the composite structure essentially from the first end of the travelling cable (T) and comes out essentially from the second end of the travelling cable (T), or makes one or more turns inside the bearer part (10) and comes out of the structure essentially from the first end or from the second end of the travelling cable (T).

8. Travelling cable (T) according to any of the preceding claims, **characterized** in that the aforementioned bearer part (10) comprises an optical fiber (O) and/or a fiber bundle, which optical fiber (O) and/or fiber bundle comprises a Fabry-Pérot-type sensor fiber for the condition monitoring of the bearer part (10).

9. Travelling cable (T) according to any of the preceding claims, **characterized** in that the aforementioned bearer part (10) comprises an optical fiber (O) and/or a fiber bundle, which optical fiber (O) and/or fiber bundle comprises a sensor fiber, comprising a Bragg grating structure for the condition monitoring of the bearer part (10).

10. Travelling cable (T) according to any of the preceding claims,

characterized in that the aforementioned bearer part (10) comprises an optical fiber (O) and/or a fiber bundle, which optical fiber (O) and/or fiber bundle comprises a sensor fiber, which functions as a Brillouin distributed fiber sensor for the condition monitoring of the bearer part (10).

11. Travelling cable (T) according to any of the preceding claims, **characterized** in that the aforementioned bearer part (10) comprises an optical fiber (O) and/or a fiber bundle, which optical fiber (O) and/or fiber bundle comprises a sensor fiber, in which fiber the time-of-flight of a light pulse is measured for the condition monitoring of the bearer part (10).

12. Elevator, preferably a passenger transport elevator and/or freight transport elevator, which comprises

- an elevator car (1),
- a counterweight (2),
- one or more suspension ropes (3), which rope (3) comprises a load-bearing composite part, which composite part comprises reinforcing fibers in a polymer matrix, and which rope (3) connects the aforementioned elevator car (1) and counterweight (2) to each other, and
- means (M, 6, 3) for moving the elevator car (1) and/or the counterweight (2), which means comprise a hoisting machine (M), which comprises means for moving the suspension roping (3) which means preferably comprise a rotating device and a traction means (6) to be rotated,

characterized in that the elevator comprises a travelling cable (T) according to any one of claims 1-11 for transmitting electrical energy and data between the elevator car (1) and the elevator hoistway (S).

13. Elevator according to claim 12, **characterized** in that the means for moving the aforementioned elevator car (1) and/or counterweight (2)

comprise hoisting roping (4), which is connected to the elevator car (1) and/or to the counterweight (2), and a hoisting machine (M), which comprises means for moving the roping (4), which means preferably comprise a rotating device and a traction means (6) to be rotated.

14. Elevator according to any one of claims 12-13, **characterized** in that the bearer part (10) of the travelling cable (T) comprises an optical fiber and/or a fiber bundle (O), which comprises a number of optical fibers, and in that the elevator comprises means for monitoring the condition of the aforementioned bearer part (10) of the travelling cable (T), and in that the means monitor changes that have occurred in an optical property, e.g. in the time-of-flight of a light pulse, in the spectrum, phase or wavelength of a light signal, of the aforementioned optical fiber (O) and/or a fiber bundle of the bearer part (10).

15. Elevator according to any one of claims 12-13, **characterized** in that the bearer part (10) of the travelling cable (T) comprises means for monitoring the condition of the aforementioned bearer part (10) of the travelling cable (T), and in that the means monitor changes that have occurred in an electrical property of the bearer part (10), e.g. in the electrical resistance or capacitance, of the bearer part (10).

CLAIMS

1. Travelling cable (T) of an elevator, more particularly of a passenger transport elevator and/or freight transport elevator, which travelling cable comprises a protective envelope (9), conductors (7, 8) for transmitting electrical energy and data between the elevator car (1) and the elevator hoistway (S), and one or more load-bearing bearer parts (10) of essentially the length of the travelling cable for fixing the travelling cable (T) at its first end to the elevator car (1) and at its second end to the elevator hoistway (S), **characterized** in that the bearer part (10) is of composite structure and comprises glass reinforcing fibers and/or aramid reinforcing fibers and/or carbon reinforcing fibers and/or polybenzoxazole reinforcing fibers and/or polyethylene reinforcing fibers and/or nylon reinforcing fibers in a polymer matrix material.

2. Travelling cable (T) according to the preceding claim, **characterized** in that the cross-section of the aforementioned bearer part (10) is essentially a conic section or of rectangular shape, in which case preferably the width of the cross-section is greater than the thickness.

3. Travelling cable (T) according to any of the preceding claims, **characterized** in that the polymer matrix material of the aforementioned bearer part (10) is of non-elastomer and the modulus of elasticity of the matrix material is at least 1.5 GPa.

4. Travelling cable (T) according to any of the preceding claims, **characterized** in that the density of the reinforcing fibers of the aforementioned bearer part (10) is less than 4000 kg/m3 and/or the tensile strength of the aforementioned reinforcing fibers is over 1500 N/mm2.

5. Travelling cable (T) according to any of the preceding claims, **characterized** in that the reinforcing fibers of the aforementioned bearer part (10) are carbon fibers, glass fibers, aramid fibers or polymer fibers, or a number of different types of fibers, comprising at least one or more of the aforementioned fibers.

6. Travelling cable (T) according to any of the preceding claims, **characterized** in that the reinforcing fibers of the aforementioned bearer part (10) are a unidirectional reinforcement essentially in the longitudinal direction of the bearer part (10) and/or wound around the bearer part (10).

7. Travelling cable (T) according to any of the preceding claims, **characterized** in that the aforementioned bearer part (10) comprises one or more optical fibers (O), more preferably a fiber bundle, disposed inside, or essentially in the proximity of the surface of, the composite structure of the bearer part (10).

8. Travelling cable (T) according to any of the preceding claims, **characterized** in that the aforementioned bearer part (10) comprises one or more optical fibers (O), more preferably a fiber bundle, which fiber or fiber bundle goes inside the composite structure essentially from the first end of the travelling cable (T) and comes out essentially from the second end of the travelling cable (T), or makes one or more turns inside the bearer part (10) and comes out of the structure essentially from the first end or from the second end of the travelling cable (T).

9. Travelling cable (T) according to any of the preceding claims, **characterized** in that the aforementioned bearer part (10) comprises an optical fiber (O) and/or a fiber bundle, which optical fiber (O) and/or fiber bundle comprises a Fabry-Pérot-type sensor fiber for the condition monitoring of the bearer part (10).

10. Travelling cable (T) according to any of the preceding claims, **characterized** in that the aforementioned bearer part (10) comprises an optical fiber (O) and/or a fiber bundle, which optical fiber (O) and/or fiber bundle comprises a sensor fiber, comprising a Bragg grating structure for the condition monitoring of the bearer part (10).

11. Travelling cable (T) according to any of the preceding claims, characterized in that the aforementioned bearer part (10) comprises an optical fiber (O) and/or a fiber bundle, which optical fiber (O) and/or fiber bundle comprises a sensor fiber, which functions as a Brillouin distributed fiber sensor for the condition monitoring of the bearer part (10).

12. Travelling cable (T) according to any of the preceding claims, **characterized** in that the aforementioned bearer part (10) comprises an optical fiber (O) and/or a fiber bundle, which optical fiber (O) and/or fiber bundle comprises a sensor fiber, in which fiber the time-of-flight of a light pulse is measured for the condition monitoring of the bearer part (10).

13. Elevator, preferably a passenger transport elevator and/or freight transport elevator, which comprises

- an elevator car (1),
- a counterweight (2),
- one or more suspension ropes (3), which rope (3) comprises a load-bearing composite part, which composite part comprises reinforcing fibers in a polymer matrix, and which rope (3) connects the aforementioned elevator car (1) and counterweight (2) to each other, and
- means (M, 6, 3) for moving the elevator car (1) and/or the counterweight (2), which means comprise a hoisting machine (M), which comprises means for moving the suspension roping

(3) which means preferably comprise a rotating device and a traction means (6) to be rotated,

characterized in that the elevator comprises a travelling cable (T) according to any of claims 1-12 for transmitting electrical energy and data between the elevator car (1) and the elevator hoistway (S).

14. Elevator according to the preceding claim 13, **characterized** in that the means for moving the aforementioned elevator car (1) and/or counterweight (2) comprise hoisting roping (4), which is connected to the elevator car (1) and/or to the counterweight (2), and a hoisting machine (M), which comprises means for moving the roping (4), which means preferably comprise a rotating device and a traction means (6) to be rotated.

15. Elevator according to any of the preceding claims 13-14, **characterized** in that the bearer part (10) of the travelling cable (T) comprises an optical fiber and/or a fiber bundle (O), which comprises a number of optical fibers, and in that the elevator comprises means for monitoring the condition of the aforementioned bearer part (10) of the travelling cable (T), and in that the means monitor changes that have occurred in an optical property, e.g. in the time-of-flight of a light pulse, in the spectrum, phase or wavelength of a light signal, of the aforementioned optical fiber (O) and/or a fiber bundle of the bearer part (10).

16. Elevator according to any of the preceding claims 13-14, **characterized** in that the bearer part (10) of the travelling cable (T) comprises means for monitoring the condition of the aforementioned bearer part (10) of the travelling cable (T), and in that the means monitor changes that have occurred in an electrical property of the bearer part (10), e.g. in the electrical resistance or capacitance, of the bearer part (10).