

DESCRIPTION

WINCH FOR ELEVATOR, AND RENEWAL METHOD OF WINCH

5 **Technical Field**

 This invention relates to a winch for an elevator, said winch having a sheave, around which hoisting ropes are to be wrapped, and a motor for driving and rotating the sheave, and also to a renewal method of renewing a winch from an existing
10 winch to a new winch.

Background Art

 JP-A-2004-123274 discloses to shorten the service suspended time of an elevator upon conducting control-enhancing renewal work on the elevator. According to the renewal method
15 of this patent document, a major part of an existing winch is used as it is, whereby replacement work on heavy equipment can be obviated. The term "control-enhancing renewal work" as mentioned above means to renew an existing winch, which is installed in a machine room of an elevator, such that it can
20 conform to a new control method.

 With the above-mentioned conventional technology disclosed in JP-A-2004-123274, the existing winch is used as it is, and an additional machine is connected as a new power source. Upon application of the conventional technology, a
25 large space is, therefore, needed to install the additional

machine. The conventional technology, therefore, involves a problem that it may be hardly applied depending on the size of a machine room in a building.

Further, improvements in running performance and energy efficiency are impaired by an existing gear box and a new connection mechanism, thereby leading to a problem that higher maintenance cost is needed for the assurance of reliability.

Disclosure of the Invention

With the foregoing circumstances of the above-mentioned conventional technology in view, the present invention has as objects thereof the provision of a winch for an elevator, which can reduce an installation space and can assure excellent running performance and energy efficiency, and a renewal method of a winch.

In one aspect of the present invention, there is provided a winch for an elevator having a car, a counterweight and hoisting ropes connecting the car and the counterweight to each other. The winch is to be provided in the elevator to move the hoisting ropes. The winch comprises a sheave about which the hoisting ropes are to be wrapped, a gearless motor for driving and rotating the sheave, a motor and sheave shaft for transmitting drive force of the gearless motor to the sheave, and a double brake for braking the gearless motor.

In another aspect of the present invention, there is also provided a renewal method of renewing a winch in an elevator

from an existing winch of a gear reduction type to the winch according to the above-mentioned aspect of the present invention. The existing winch is renewed by disassembling a motor, a brake, gears, a sheave and a sheave shaft from the existing winch, and
5 in the existing winch in a state of having been disassembled, assembling the sheave, gearless motor, motor and sheave shaft and double brake of the winch according to the above-mentioned aspect of the present invention.

The winch and renewal method according to the present
10 invention can make use of the components of the existing winch to as full extent as possible, and compared with the conventional winch and renewal method, can reduce an installation space and can ease restrictions upon installing the winch in a machine room.

15 As drive force of the gearless motor is directly transmitted to the sheave via the motor and sheave shaft, the winch and renewal method according to the present invention can assure excellent running performance and energy efficiency. Accordingly, the winch and renewal method according to the
20 present invention can obtain high reliability and can reduce the cost required for maintenance, both compared with the conventional winch and renewal method.

Brief Description of the Drawings

FIG. 1 is a side view showing essential parts of an elevator
25 provided with an embodiment of a winch according to the present

invention.

FIG. 2 is a plan view of the layout of a machine room in which the winch of the embodiment is installed.

FIG. 3 is a side view showing an elevator including a winch
5 existing before renewal of the elevator.

FIG. 4 is a plan view of the layout of a machine room including the existing winch.

Best Mode for Carrying out the Invention

Referring first to FIGS. 3 and 4, a description will be
10 made about an existing winch before renewal and an elevator including the existing winch.

As shown in FIG. 3, the elevator includes the existing winch 12, which is installed, for example, in a machine room 11 arranged above an elevator shaft 1 and which has a motor 15
15 and a sheave 13. A car 2 and a counterweight 3, both of which are disposed in the elevator shaft 1, are connected to each other via hoisting ropes 4, and the hoisting ropes 4 are wrapped about the sheave 13. By rotating the sheave 13 such that the hoisting ropes 4 are driven by traction, the car 2 and counterweight 3
20 go up and down via a deflection pulley 17.

On a floor surface 11a of the machine room 11, a machine beam 18 is placed. On the machine beam 18, beam couplers 20 are arranged via anti-vibration rubbers 21. On the beam couplers 20, a sub-beam 19 is placed. On the sub-beam 19, the existing
25 winch 12 is installed.

The existing winch 12 is of a gear reduction type, and is provided, in addition to the above-mentioned motor 15 and sheave 13, with unillustrated gears, i.e., a gear box for transmitting drive force of the motor 15, a brake 16 for
5 controlling the motor 15, a sheave shaft 14 to which the sheave 13 is connected, and so on.

Referring next to FIGS. 1 and 2, a description will be made of an embodiment of a winch according to the present invention for an elevator and an embodiment of a renewal method of the
10 existing winch.

As shown in FIGS. 1 and 2, the winch 12a of this embodiment for the elevator is of a gearless drive type as opposed to the above-mentioned existing winch 12, and is provided, in addition to a sheave 13a around which the hoisting ropes 4 are to be wrapped,
15 with a gearless motor 15a for driving the sheave 13a, a motor and sheave shaft 14a for transmitting drive force of the gearless motor 15a to the sheave 13a, and a double brake 16a for braking the gearless motor 15a.

Upon renewing the above-mentioned existing winch 12 of
20 the gear reduction type, which is shown in FIGS. 3 and 4, to the new winch 12a shown in FIGS. 1 and 2, the motor 15, the brake 16, the unillustrated gears, i.e., the gear box, the sheave 13 and the sheave shaft 14 are disassembled from the existing winch 12 shown in FIGS. 3 and 4. To the components still remaining
25 after the disassembly of the respective components as described

above, the motor and sheave shaft 14a, gearless motor 15a, double brake 16a and sheave 13a are assembled. As a result, the existing winch 12 shown in FIGS. 3 and 4 has now been renewed to the winch 12a shown in FIGS. 1 and 2.

5 According to the winch and winch renewal method of these embodiments configured as described above, the new sheave 13a, gearless motor 15a, motor and sheave shaft 14a and double brake 16a are assembled to the components still remaining after the disassembly of the motor 15, brake 16, sheave 13 and sheave shaft
10 14 from the existing winch 12, in other words, the components of the existing winch 12 are used to as full extent as possible. It is, therefore, possible to reduce an installation space and to ease restrictions upon installing the winch 12a in the machine room 11.

15 Because drive force of the gearless motor 15a is directly transmitted to the sheave 13a via the motor and sheave shaft 14a, excellent running performance and energy efficiency can be assured. It is, therefore, possible to obtain high reliability and to reduce the cost required for maintenance.

20 In the configuration of the above-described winch of this embodiment, a flywheel may be attached to the motor and sheave shaft 14a. With the winch of this configuration, the distance of movement of the car 2 can be reduced by the flywheel if a situation arises that the car 2 is about to abnormally run while
25 doors are open. The flywheel, therefore, contributes to the

assurance of safety.

CLAIMS

1. A winch for an elevator having a car, a counterweight and hoisting ropes connecting the car and the counterweight to each other, said winch being to be provided in the elevator to
5 move the hoisting ropes, wherein:

the winch comprises a sheave about which the hoisting ropes are to be wrapped, a gearless motor for driving and rotating the sheave, a motor and sheave shaft for transmitting drive force of the gearless motor to the sheave, and a double brake for braking
10 the gearless motor.

2. The winch according to claim 1, further comprising a flywheel attached to the motor and sheave shaft.

3. A renewal method of renewing a winch in an elevator from an existing winch of a gear reduction type to the winch
15 according to claim 1, wherein:

the existing winch is renewed by disassembling a motor, a brake, gears, a sheave and a sheave shaft from the existing winch, and in the existing winch in a state of having been disassembled, assembling the sheave, gearless motor, motor and
20 sheave shaft and double brake of the winch according to claim 1.