CLAIMS

1. An elevator control system for controlling, by vector control, a synchronization motor configured to elevate and lower an elevator car of an elevator, the elevator control system comprising:

a brake controller configured to output a brake release command for releasing a brake for braking a rotation of the synchronization motor;

a control starter configured to start, before the brake is released, zero speed control of controlling a rotational speed of the synchronization motor to zero, or zero servo control of retaining a magnetic pole position of the synchronization motor; and

a d-axis current controller configured to start to flow d-axis current in the synchronization motor before the brake is released,

wherein the elevator control system is a load-sensor-less elevator control system that does not include a load sensor for detecting load of the elevator car.

2. The elevator control system according to claim 1, wherein

before the brake is released, the control starter is configured to start the zero speed control of controlling a rotational speed of the synchronization motor to zero.

3. The elevator control system according to claim 1 or 2, wherein

the d-axis current controller is configured to consecutively increase the d-axis current to be flowed in the synchronization motor, over a predetermined period from a flow start of the d-axis current to a release of the brake.

4. The elevator control system according to claim 3, wherein

while consecutively increasing the d-axis current, the d-axis current controller is configured to change a rate of increase.

5. The elevator control system according to claim 4, wherein

while consecutively increasing the d-axis current, the d-axis current controller increases a rate of increase of the d-axis current.

6. The elevator control system according to claim 4, wherein

while consecutively increasing the d-axis current, the d-axis current controller is configured to decrease a rate of increase of the d-axis current after

increasing a rate of increase of the d-axis current.

7. The elevator control system according to any one of claims 1 to 6, further comprising

a q-axis current controller configured to control q-axis current to be flowed in the synchronization motor,

wherein the d-axis current controller is configured to increase the d-axis current to a target value so that the d-axis current becomes larger than the q-axis current at a time point at which the brake is released.

8. The elevator control system according to claim 2, wherein

after the brake is released, the control starter is configured to end the zero speed control, and to start speed-up control of increasing a rotational speed of the synchronization motor, and

after the speed-up control is started, the d-axis current controller is configured to consecutively decrease the d-axis current to be flowed in the synchronization motor.

9. The elevator control system according to any one of claims 1 to 8, further comprising:

a sensor configured to detect vibration and/or sound produced by the synchronization motor; and

a parameter adjuster configured to adjust a parameter related to the d-axis current to be flowed in the synchronization motor, based on a detection value of the sensor.

10. The elevator control system according to any one of claims 1 to 9, wherein

the synchronization motor is a pencil-shaped synchronization motor having shape elongated in an axis direction.

11. A motor control apparatus for controlling, by vector control, a synchronization motor configured to elevate and lower an elevator car of an elevator, the motor control apparatus comprising:

a control starter configured to start, before a brake for braking a rotation of the synchronization motor is released, zero speed control of controlling a rotational speed of the synchronization motor to zero, or zero servo control of retaining a magnetic pole position of the synchronization motor; and

a d-axis current controller configured to start to flow d-axis current in the

synchronization motor before the brake is released,

wherein the motor control apparatus is a load-sensor-less motor control apparatus that does not include a load sensor for detecting load of the elevator car.

12. An elevator control method for controlling, by vector control, a synchronization motor configured to elevate and lower an elevator car of an elevator, the elevator control method comprising:

outputting a brake release command for releasing a brake for braking a rotation of the synchronization motor;

starting, before the brake is released, zero speed control of controlling a rotational speed of the synchronization motor to zero, or zero servo control of retaining a magnetic pole position of the synchronization motor; and

starting to flow d-axis current in the synchronization motor before the brake is released, without using a result of detecting load of the elevator car.

13. An elevator control system for controlling, by vector control, a synchronization motor configured to elevate and lower an elevator car of an elevator, the elevator control system comprising:

a brake controller configured to output a brake release command for releasing a brake for braking a rotation of the synchronization motor;

a control starter configured to start, before the brake is released, zero speed control of controlling a rotational speed of the synchronization motor to zero, or zero servo control of retaining a magnetic pole position of the synchronization motor; and

a d-axis current controller configured to start to flow d-axis current in the synchronization motor before the brake is released, while keeping q-axis current flowing in the synchronization motor lower than the d-axis current during a predetermined period.

14. The elevator control system according to claim 13, wherein the d-axis current controller is configured to start to flow the d-axis current in the synchronization motor before the brake is released, without starting to flow the q-axis current in the synchronization motor before the brake is released.