

FASTENING OF THE STATOR OF A FLAT ELEVATOR MOTOR

The present invention relates to an arrangement for mounting the stator in a flat elevator motor having a motor body, a stator fastened to it and a rotor.

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The physical dimensions of the elevator machine have a relevance to the size of the elevator shaft and/or building, depending on where the machine is placed. When the elevator machine is placed in the elevator shaft or beside it, the thickness of the elevator machine has an essential importance regarding the space required.

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US patent specification 5,962,948 discloses an elevator machine designed to be placed in the elevator shaft and having a flat, discoid elevator motor comprising a stator and a rotor. The rotor comprises a rotor disc provided with permanent magnets a traction sheave mounted on it. The stator has a stator core and windings. The stator is fastened between the motor body and the rotor by a screw fastening technique.

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The object of the present invention is to achieve a new type of mounting structure for fastening the stator to the body of the motor, by means of which it is possible to improve the cooling of the stator and to achieve a stator structure that is very compact as compared with prior-art solutions.

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In the mounting structure of the invention, the stator is fitted inside a trough-like mounting part, wherein the space between the stator winding and the mounting part is filled with a thermally conducting filler serving to conduct heat from the stator to the mounting part. The characteristic features of the invention are presented in detail in the claims below.

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The invention makes it possible to achieve an economical, simple and reliable stator fastening arrangement. In addition, efficient cooling and consequently a high power density as well is achieved. In the solution of the invention, the insulating gaps can be smaller than in prior-art solutions, allowing the elevator motor to be made shorter in the axial direction than prior-art motors, which is very important especially in the case of elevator motors designed to be placed in the elevator shaft. In addition, the use of a filler prevents soiling of the stator windings. Therefore, the protection rating of the motor can be relatively easily raised.

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Moreover, the mounting part and the stator form a single unit, which leads to a

rigid and firm structure.

In the following, the invention will be described in detail by the aid of an example with reference to the attached drawing, which illustrates the stator mounting
5 arrangement of the invention.

The figure presents a flat, discoid elevator motor 2 used in a gearless elevator machine placed close to a guide rail 1. It comprises a disc 4 formed in the motor body 3 and a stator 5 fastened to said disc. The stator comprises a winding core
10 51 and windings 52. Mounted with bearings 3 on the body 3 are a round rotor disc 7 and a traction sheave 8. The disc 4 has on its inner side a recess 41 formed for the rotor.

The stator 5 is mounted outside the rotor 7, i.e. on the opposite side of the disc
15 4 in the trough 91 of a trough-shaped mounting part 9 made of e.g. aluminum. The mounting part 9 is fastened to the disc 4 with screws 10 at the outer edge. The mounting part 9 is provided with cooling fins 92 on the outside. The space 11 between the winding 52 and the mounting part 9 is filled with resin 12, which has a good thermal conductivity. Thus, the winding 52 and especially its ends
20 are effectively cooled inside the mounting part 9. The resin also binds the stator fast to the mounting part 9, no other fastening elements being thus needed.

It is obvious to the person skilled in the art that different embodiments of the invention are not limited to the example described above, but that they may be
25 varied within the scope of the claims presented below.

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Claims:

1. A stator fastening arrangement for a flat elevator motor having a motor body—provided with a stator,—comprising:

a stator core;

a winding, and

a rotor—fitted in conjunction with the stator,

wherein

the stator—is fitted within a mounting part—fastened to the motor body,

a space provided between the mounting part and the stator—is filled with a thermally conductive filling material for conducting heat away from the stator to the mounting part, and

the filling material is provided on one or more axial, outer circumferential surfaces of the stator and in contact with the mounting part so as to fasten the stator to the mounting part.

2. The fastening arrangement of claim 1, wherein the filling material is embodied as a castable resin material.

3. The fastening arrangement of claim 1,—wherein

the mounting part—is fastened to the motor body—at an outer edge thereof by one or more fastening elements, and

the stator is disposed on an opposite side of the motor body—relative to the rotor.

4. The fastening arrangement of claim 1, wherein the mounting part—is composed of aluminum.

5. The fastening arrangement of claim 1, wherein the mounting part includes cooling fins.

6. The fastening arrangement of claim 1, wherein the electric motor is embodied as a discoid elevator motor.