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Fastening of the stator of a flat elevator motor

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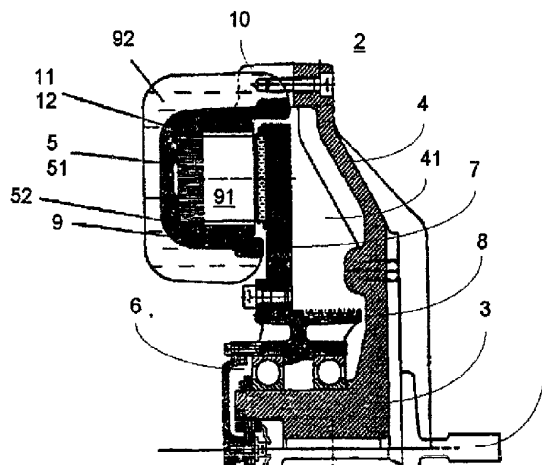
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(54) Title: FASTENING OF THE STATOR OF A FLAT ELEVATOR MOTOR



(57) Abstract: A stator fastening arrangement in a flat elevator motor (2) having a motor body (4) in which are arranged a stator (5) comprising a stator core (51) and a winding (52), and a rotor (7) fitted in conjunction with the stator. The stator (5) is fitted within a substantially trough-like mounting part (9) fastened to the motor body (4), and the space between the mounting part (9) and the stator (5) is filled with a thermally conductive filling material (12) serving to conduct heat from the stator to the mounting part (9).



For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

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 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 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 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 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 varied within the scope of the claims presented below.

CLAIMS

1. Stator fastening arrangement in a flat elevator motor (2) having a motor body (4) provided with a stator (5) comprising a stator core (51) and a winding (52),
5 and a rotor (7) fitted in conjunction with the stator,
characterized in that
the stator (5) is fitted within a substantially trough-like mounting part (9) fastened to the motor body (4), and that
the space between the mounting part (9) and the stator (5) is filled with a thermally conductive filling material (12) serving to conduct heat from the stator to the mounting part (9).
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2. Fastening arrangement according to claim 1, **characterized** in that the stator (5) is fastened to the mounting part (9) by means of the filling material.
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3. Fastening arrangement according to claim 1, **characterized** in that the filling material is a castable material, preferably resin.
4. Fastening arrangement according to claim 1 in an elevator motor having a discoid body (4) and a rotor (7), **characterized** in that the trough-like mounting part (9) is fastened to the motor body (4) at the outer edge by means of fastening elements (10), the stator being disposed on the opposite side of the motor body (4) relative to the rotor.
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5. Fastening arrangement according to claim 1, **characterized** in that the mounting part (9) is made of aluminum.
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6. Fastening arrangement according to claim 1, **characterized** in that the mounting part (9) is provided with cooling fins (92).
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7. Fastening arrangement according to claim 1, **characterized** in that the electric motor is a discoid elevator motor.

