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(54) Fixing method for a domestic washing machine motor, and the resultant washing machine

(57) On and integral with the washing machine tub (3) there are provided, for supporting the motor (10), equidirectional coaxial pins (2) on which holes or eyelets (7) provided on the motor (10) are mounted. To eliminate slack between the pins (2) and the holes (7), before the mounting operation the pins are provided with an application of silicone rubber which sets on exposure to air, to pass from a pasty state to a rubbery state. While still in the pasty state the pins (2) are inserted into the holes (7) to form an elastic ring (11) which absorbs vibration and reduces noise.

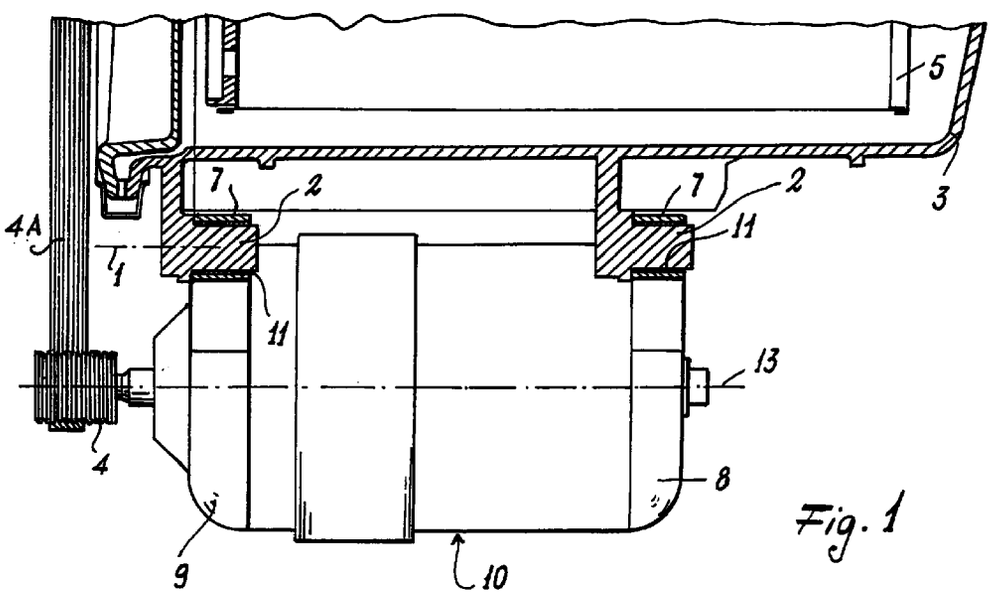

Fig. 1

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Description

This invention relates to a method for fixing to a washing machine tub the electric motor which drives the drum positioned in the tub. The invention also relates to the resultant washing machine. Various methods are used for fixing the motor to the tub. For example in EP-A-1 0413093 the motor is fixed to the spider structure which supports the tub. One of the spider arms is used as a fixing support for the motor. The motor bearing plate at the motor drive end carries an arm provided with a pin mounted in such a manner as to be able to rotate within the spider arm via a rubber/metal bush. The arm carried by the plate is fixed to the spider arm by a screw means positioned in an arcuate slot in correspondence with the bearing plate. This arrangement is supposed to facilitate motor assembly. It is however complicated, it seriously stresses the mechanical parts and does not adequately exclude vibration or noise.

In another arrangement the motor bearing plates are provided with pins which are inserted via nylon bushes into holes present in appendices on the tub. This known arrangement does not allow take-up of slack, nor does it eliminate vibration and noise.

A further arrangement which has the advantage of nullifying slack and eliminating noise and vibration is however particularly complex in that fixing is by bolts inserted through two stop washers, a rigid spacer, a rubber damping block and a tightening nut.

The main object of the present invention is to provide a fixing method which besides being considerably simpler than the known methods enables slack, noise and vibration to be eliminated.

A further object of the present invention is to provide a washing machine comprising a motor fixed by the method of the invention. These and further objects which will be apparent from the detailed description given hereinafter are attained by a fixing method and washing machine the inventive aspects of which are defined in the accompanying claims.

The invention will be more apparent from the detailed description of a preferred embodiment thereof provided hereinafter by way of non-limiting example with reference to the accompanying drawing, on which:

Figure 1 is a partial vertical section taken through the motor support pins;

Figure 2 is a schematic section taken through one of the pins and showing the distributor by which the pin is coated with silicone rubber.

As is well known, washing machines comprise a tub 3, a clothes drum 5 rotatably supported within the tub 3, an electric motor 10 supported by the tub, and a transmission comprising a belt 4a and pulleys 4 for transmitting motion from the motor to the drum 5. Whatever arrangement is used for fixing the motor to the tub, it must be possible to adjust the tension in the belt 4A. This is achieved by supporting the motor 10 on a geometrical axis 1 parallel to its shaft so that it can be angularly shifted about this geometrical axis until it reaches the angular position which gives correct operation of the belt. When in this angular position the motor is locked by a nut and a bolt which passes through both an arcuate slot and a cylindrical hole, one for example in a part of the tub and the other in a part of the motor. According to the invention the said geometrical axis 1 pertains to two spaced-apart coaxial pins projecting in the same direction and integral with the tub 3, which as is well known is constructed of a filled synthetic material. Before mounting the motor on the tub, a coating 11 of silicone rubber in the pasty state (see Figure 2) is applied to said coaxial pins 2.

This application is achieved by injection using a conventional dispensing gun, not shown, the exit of which is connected to a tube 20 having its end mounted on a tubular appendix of a distributor indicated overall by 22. The distributor 22 comprises a tubular cylindrical part 23 closed at one end and open at the opposite end. The inner diameter of the part 23 exceeds that of the pin 2 by twice the thickness of the coating 11. Against the closed end of the distributor there adheres a disc 24 of synthetic material such as teflon which defines the inner length (L) of the tubular part 23.

To apply the silicone rubber coating 11 the distributor is mounted on the pins 2 as shown in Figure 2 and is removed after the application. Corresponding eyelets 7 provided on the bearing plates 8, 9 of the electric motor 10 are mounted on the thus coated coaxial pins 2, the motor axis being indicated by 13 and being parallel to the axis 1 of the pins 2.

After a certain time the silicone rubber passes from the pasty state to the rubbery state without volume change, to form an intermediate layer between the pins 2 and the eyelets 7 which adheres securely to the pins 2, to nullify slack and eliminate vibration and noise in a simple and effective manner.

The invention also includes an embodiment in which the eyelets 7 are provided with a dead hole instead of a through hole.

Claims

1. A method for fixing to a washing machine tub (3) the relative electric motor (10) which by means of a belt transmission (4, 4A) drives the drum (5) rotatably supported within the tub (3), the motor (10) being supported on a geometrical axis (1) parallel to its own axis (13), characterised in that the axis (1) on which the motor (10) is supported pertains to two spaced-apart support pins (2) extending in the same direction and integral with the tub (3), a coating (11) of silicone rubber in the pasty state being applied to said pins (2), support eyelets (7) provided on the motor (10) being mounted on said pins (2) after said application.

2. A washing machine comprising a tub (3), a motor

(10) supported by the tub (3), a clothes drum (5) mounted within the tub (3) and a belt transmission (4, 4A) for transmitting motion from the motor (10) to the drum (5), the motor (10) being supported on a geometrical axis (1) parallel to the axis (13) of the motor (10), characterised in that said geometrical axis is defined by two equidirectional pins (2) integral with the tub (3), eyelets (7) of the motor (10) being mounted on said pins (2), and a silicone rubber layer (11) being interposed between the pins (2) and the eyelets (7).

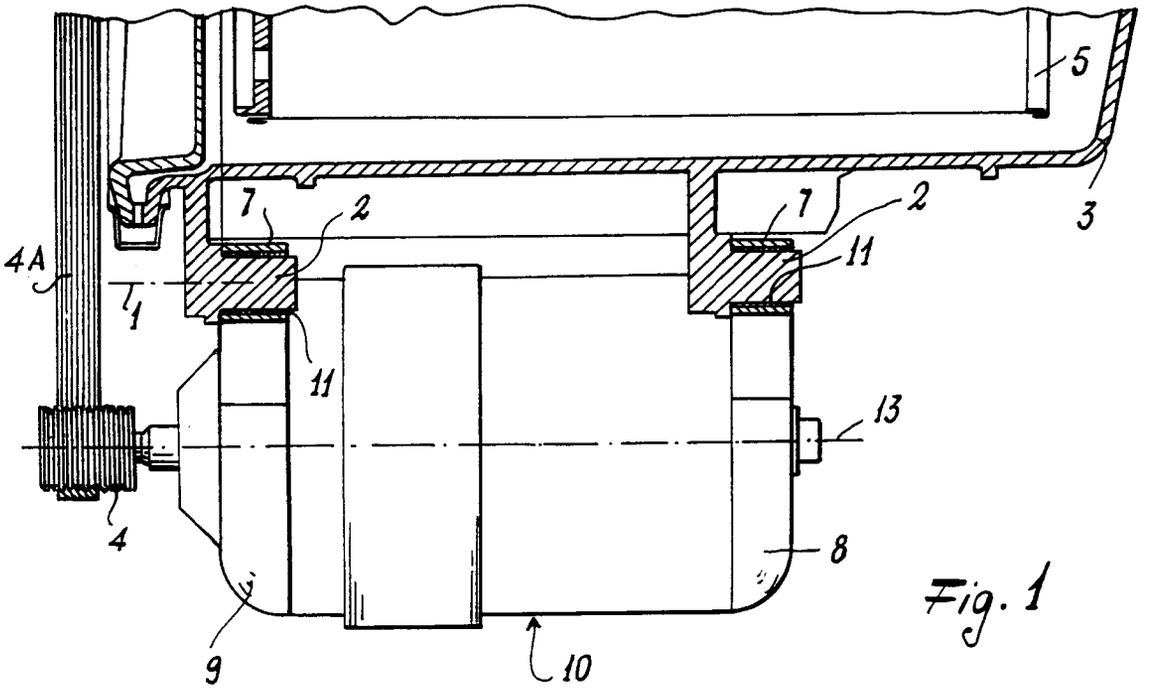

Fig. 1

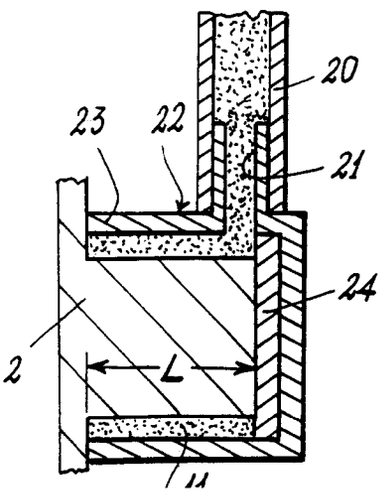

Fig. 2

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 95 10 9876

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	DE-U-91 08 936 (LICENTIA PATENT-VERWALTUNGS-GMBH) * the whole document * ---	1,2	D06F37/20
A	DE-U-71 26 566 (SIEMENS-ELECTROGERÄTE GMBH) * the whole document * ---	1,2	
A	EP-A-0 152 745 (INDUSTRIE ZANUSSI S.P.A.) * page 7, line 14-17; figure 2 * ---	1,2	
A	GB-A-2 099 233 (NV PHILIPS' GLOEILAMPENFABRIEKEN) * the whole document * ---	1,2	
D,A	EP-A-0 413 093 (BOSCH-SIEMENS HAUSGERÄTE GMBH) * the whole document * -----	1,2	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

D06F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	21 December 1995	Kellner, F

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
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E : earlier patent document, but published on, or after the filing date
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