

- (21) Application No. 39842/77 (22) Filed 23 Sept. 1977
 (31) Convention Application No. 7 630 468 U
 (32) Filed 29 Sept. 1976 in
 (33) Fed. Rep. of Germany (DE)
 (44) Complete Specification published 9 July 1980
 (51) INT CL³ H01R 9/00; H02K 11/00
 (52) Index at acceptance
 H2E 11
 H2A TP



(54) ELECTRICAL MOTOR COMPRISING A TERMINAL

(71) We, SIEMENS AKTIEN-GESELLSCHAFT, a German company, of Berlin and Munich, Germany (Fed Rep), do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed to be particularly described in and by the following statement:—

The invention relates to an electrical motor comprising a terminal, and is particularly but not exclusively applicable to a motor (more particularly a fractional-horsepower motor) comprising at least two fixedly interconnected motor component parts, more particularly an end shield and a motor housing or a laminated stator assembly, which come into engagement with one another in the assembly of the motor, and at least one of which has an electrical terminal for connection to an earthing conductor.

Usually the earthing terminal (often in the form of a single or double tongue) is screwed or rivetted to a motor component part suitable for connection to an earthing conductor. The terminal can be applied with the interposition of additional parts, or can be threaded onto a locating screw provided for the assembly of the motor and screwed tight.

According to the present invention there is provided an electrical motor comprising two parts secured together in abutment with one another, one of the parts comprising a recess which faces the other part and which contains at least a portion of an electrical earthing terminal for at least said one part, the electrical terminal having been secured in said recess by said portion thereof having been sandwiched and clamped between the two parts as they were secured together in abutment with one another.

In this way, it is provided that the terminal is automatically firmly gripped during the securement together of the two parts without any additional part and without any additional operations being necessary. A reliable electrical connection may be provided independently of the manner and duration of operation.

Preferably, the assembly is made such that

even in the event of breakage of the securement between the two parts the electrical connection between the terminal and the one part is maintained.

Since the terminal is not threaded onto a locating screw, no additional means are required to prevent the terminal turning during its securement.

Preferably, the recess is provided in a face of the one part which faces the other part, the recess being internally wedge-shaped in a direction opening towards this face. In this way a simple securement of the terminal by clamping is obtained, and also there may take place a plastic deformation at least in that portion of the wedge-shape which is further from the face of the one part. This can be advantageous in that it results in a good mechanical retention and a good electrical transfer.

According to one development, the recess may be formed for example by milling or stamping in the one part.

For assisting in retaining the terminal in the recess, it may be advantageous for the terminal itself to be pre-bent and to be firmly clamped in the recess by its own resilience.

The terminal portion and at least one of the two parts may have projections which interengage to prevent the terminal being withdrawn from the recess. This provides a positive locking action.

For a better understanding of the invention and to show how it may be put into effect reference will now be made, by way of example, to the accompanying drawing in which:—

Figure 1 is a side elevation of a fractional-horsepower motor provided with a protective (i.e. earthing) conductor connecting terminal; and

Figure 2 is a plan view of a detail of Figure 1.

Figures 1 and 2 show an unhoused fractional-horsepower motor, on both sides of a laminated stator core assembly 3 of which there are engaged cast bearing brackets 2. The latter are fixedly connected and to the laminated stator core assembly 3 by locating

screws 7 extending axially through the whole laminated assembly. The rotor shaft 5 is mounted in the two bearing brackets 2.

The left-hand bearing bracket 2 is formed with an inlet slot 4 which has a bevel or wedge-shape widening towards the laminated stator assembly 3. Prior to tightening the screws 7 a connecting terminal 1 for connection to an earthing conductor is introduced into the said bevel until it bears against the latter. In this position, the connecting terminal 1 for the earthing conductor projects out of the inlet slot 4 at least to the extent of an oversize *a*. In the locating of the bearing brackets 2 on both sides of the core assembly 3 by means of tightening the locating screws 7, the left hand bearing bracket 2 is moved towards the laminated core assembly 3 and thus at the same time firmly clamps the connecting terminal 1 in the inlet slot 4 with a non-positive locking action. Even if the locating screws 7 should become loose due to rough operating conditions so that a firm and good electrical junction between the locating screws 7 and the bearing brackets 2, or between the latter and the laminated stator assembly 3, is not completely ensured, the protective conductor connecting terminal 1 is in all circumstances held fast in the bevelled slot 4 independently of the clamping force of the locating screws 7. This is because the terminal 1 has been forced into the bevelled slot when the screws 7 were tightened, and is firmly held there by the wedging action of the walls of the slot 4 even when the screws 7 become loose. If an even firmer holding were required, a positive locking action could be provided by the terminal 1 and the slot 4 being formed with interengaging projections (not shown).

The described and illustrated embodiment has a terminal 1 which is simple to manufacture and fit, and which provides electrical connection even under demanding operating conditions.

Instead of being provided in a bearing bracket 2, the slot 4 could be provided in a cast motor housing (not shown) co-operating with a bearing bracket. Alternatively, the slot 4 could be provided in the core assembly 3.

Instead of the slot being provided in one part only, a further slot to receive the terminal 1 could be provided in the other part also.

55 WHAT WE CLAIM IS:—

1. An electrical motor comprising two parts secured together in abutment with one another, one of the parts comprising a recess which faces the other part and which contains at least a portion of an electrical earth-

ing terminal for at least said one part, the electrical terminal having been secured in said recess by said portion thereof having been sandwiched and clamped between the two parts as they were secured together in abutment with one another. 65

2. A motor according to claim 1, which is a fractional horsepower motor.

3. A motor according to claim 1 or 2, wherein the two parts are a bearing bracket and a motor housing. 70

4. A motor according to claim 1 or 2, wherein the two parts are a bearing bracket and a laminated stator core.

5. A motor according to any one of the preceding claims, wherein the recess is a slot. 75

6. A motor according to claim 3 or 4, or claim 5 when appended to claim 3 or 4, wherein the recess is in the bearing bracket.

7. A motor according to claim 3, or claim 5 when appended to claim 3, wherein the recess is in the motor housing. 80

8. A motor according to any one of the preceding claims, wherein the recess is provided in a face of the one part which faces the other part and which is spaced therefrom such that the terminal projects from the recess at said face. 85

9. A motor according to claim 3 or 4 or any one of claims 5 to 8 when appended to claim 3 or 4 wherein the bearing bracket is a cast part. 90

10. A motor according to claim 3 or any one of claims 5 to 9 when appended to claim 3, wherein the motor housing is a cast part. 95

11. A motor according to any one of the preceding claims, wherein the recess is provided in a face of the one part which faces the other part, the recess being internally wedge-shaped in a direction opening towards this face. 100

12. A motor according to any one of the preceding claims, wherein the recess was made by milling or stamping.

13. A motor according to claim 11, or claim 12 when appended to claim 11, wherein the internal faces defining the wedge-shape of the recess are plastically deformed by the terminal. 105

14. A motor according to any one of the preceding claims, wherein the terminal is a resilient member which is retained in the recess at least partly by its own resilience. 110

15. An electrical motor substantially as hereinbefore described with reference to the accompanying drawing. 115

16. A motor according to any one of the preceding claims, wherein the terminal portion and at least one of said two parts have projections which interengage to prevent the terminal being withdrawn from the recess. 120

5 17. A method of assembling an electrical
motor according to claim 1, comprising
locating the terminal in the recess before the
two parts are secured together in abutment
with one another thereby to sandwich and
clamp the terminal between them when they
are secured together.

10 18. A method of assembling an electrical
motor substantially as hereinbefore described
with reference to the accompanying drawing.

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Printed for Her Majesty's Stationery Office by the Courier Press, Leamington Spa, 1980.
Published by the Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from
which copies may be obtained.

