

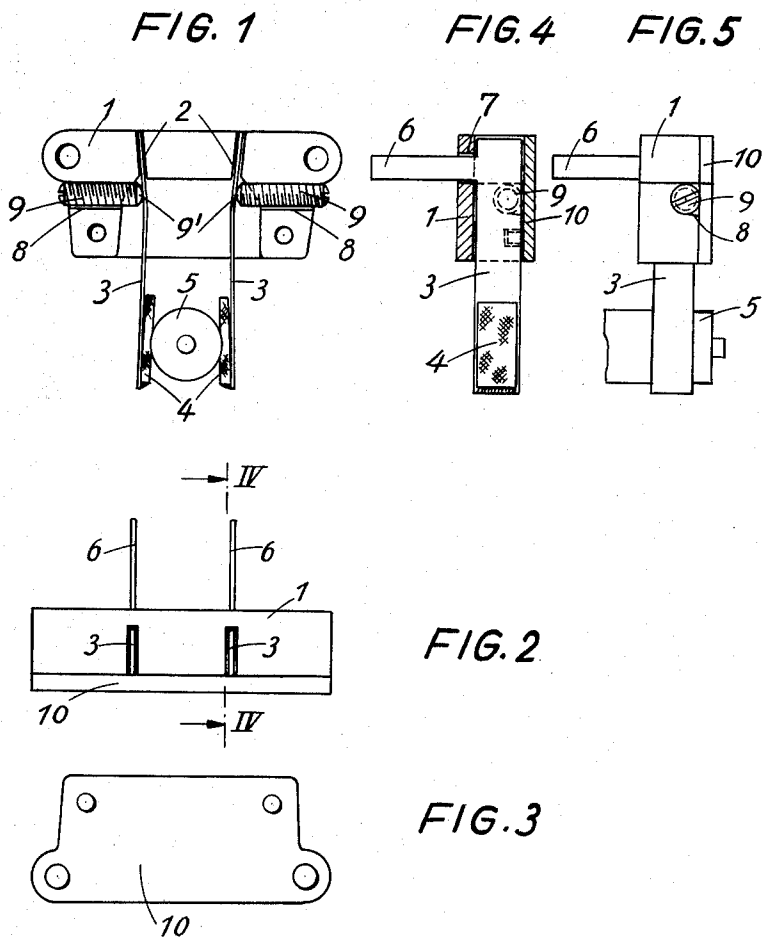
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BRUSH HOLDER WITH COMMUTATOR BRUSHES FOR ELECTRIC MOTOR

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**BRUSH HOLDER WITH COMMUTATOR BRUSHES
FOR ELECTRIC MOTOR**Hermann Helmut Pfeiffer, Pellergasse 38, Fischbach, near
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The present invention relates to a brush holder with commutator brushes for an electric motor, especially for one of a very small size, in which the brushes are provided with leaf springs under initial tension for pressing the brushes against the commutator. Such an initial tension of the leaf springs is absolutely required in order to attain the highest possible contact pressure and thus the lowest possible contact resistance between the brushes and the commutator.

Prior to this invention, this initial tension of the leaf springs was attained by bending them by means of tweezers. Such an adjustment of the initial tension is, however, very complicated and inaccurate and requires considerable time as well as great skill and experience.

It is an object of the present invention to provide a brush holder of the above-mentioned type which is designed and improved so as to permit the initial tension of the leaf springs to be carried out very quickly and accurately and in a very simple manner.

According to the present invention this object is attained by providing a setscrew for each leaf spring so that by the simple adjustment of the setscrews by means of a screw driver, the leaf springs may be given very easily and quickly the exact initial tension as required.

In the conventional brush holders the leaf springs are usually inserted into recesses and are held in this position by a cover which is then connected to the brush holder. According to a preferred feature of the invention, however, the brush holder is provided with groove-like recesses which extend substantially vertical to the leaf springs and the walls of which are provided with partial screw threads. A setscrew is then inserted into this recess from the open side thereof and is secured in its position within the recess by the application of the cover. The front ends of these setscrews then engages directly upon the pivotable leaf springs, and when the setscrews are turned in one direction or the other, the initial tension of the leaf springs is increased or reduced.

Another important feature of the invention resides in the simplicity of manufacture and installation of the brush holder. This is attained by making the brush holder of an elastic material, for example, a suitable plastic, and by simply pressing the setscrews into the plain untapped recesses so that the screw threads of the setscrews will be impressed into the walls of the recesses and thus form corresponding screw threads therein. The brush holder may thus be made, for example, of a thermoplastic by means of a simple mold, and the recesses do not have to be provided with any screw threads for receiving the setscrews since these screw threads are formed in the recesses automatically by the setscrews themselves when they are pressed into the recesses from their open sides which are subsequently closed by the cover which then retains the setscrews tightly within the impressed screw threads of the recesses. If the setscrews are made of a sufficient length as to project from the outer ends of the recesses, they may then be easily adjusted by a screw driver, preferably by one which has a projecting socket which engages over the projecting part of the setscrew and thus prevents the screw driver from slipping out of the slot of the screw.

According to another embodiment of the invention, the

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setscrews may, of course, also be in the form of grub screws, the outer ends of which are sunk into the outer ends of the recesses which are then preferably conically enlarged to the outside to permit the screw driver to be easily inserted.

The feature of the invention of pressing setscrews into plain untapped grooves so as to form corresponding screw threads therein and then to hold the setscrew therein by a cover is not limited to brush holders, but may also be applied to other devices or apparatus.

The features and advantages of the present invention will become more clearly apparent from the following detailed description thereof which is to be read with reference to the accompanying drawings, in which—

FIGURE 1 shows a front view of a brush holder according to the invention with brushes and setscrews inserted therein;

FIGURE 2 shows a top view of the brush holder according to FIGURE 1 with the cover applied thereon;

FIGURE 3 shows a top view of the cover according to FIGURE 2;

FIGURE 4 shows a cross section which is taken along line IV—IV of FIGURE 2; while

FIGURE 5 shows a side view which is taken from the left side of FIGURE 2.

The brush holder 1 according to the invention may consist, for example, of a thermoplastic material and be made by injection molding. It is provided with slots 2 into which leaf springs 3 are inserted, the lower end of each of which carries a member 4, for example, a brush pad of an electrically conductive material which engages upon the commutator 5. Each leaf spring 3 has a lateral extension 6 which engages into a slot 7 so that the leaf springs are prevented from shifting in the axial direction.

The brush holder 1 is further provided with guide grooves 8 into which setscrews 9 are impressed and are held in this position by a cover 10 which may consist of the same material as the brush holder 1 and may be secured to the brush holder 1 by means of screws or rivets. The guide grooves 8 originally do not contain any screw threads, but setscrews 9 are impressed into them from their open sides in such a manner that the corresponding threads are formed therein automatically. When setscrews 9, the front ends 9' of which engage upon the leaf springs 3, are turned in one direction or the other, the tension of leaf springs 3 will be increased or reduced.

Since setscrews 9 are pressed by force into guide grooves 8 and are held therein by the cover 10, these setscrews will be securely clamped in guide grooves 8 in any position to which they are adjusted. Thus, any unintentional adjustment of these setscrews during the operation of the electric motor is completely prevented and, having once been made, any adjustment of the tension of leaf springs 3 will always be maintained.

Although my invention has been illustrated and described with reference to the preferred embodiment thereof, I wish to have it understood that it is in no way limited to the details of such embodiment, but is capable of numerous modifications within the scope of the appended claims.

Having thus fully disclosed my invention, what I claim is:

1. A commutator brush holder for an electric motor comprising a brush holding member having spring receiving recesses therein and groove-like recesses extending substantially at right angles to said spring receiving recesses, leaf springs having first ends inserted in the spring receiving recesses from one side of the brush holding member, said leaf springs having second projecting ends with brushes thereon adapted to be pressed by said leaf springs against the commutator of said motor, set screw means

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adapted to be inserted from said side into the groovelike recesses for acting on the leaf springs intermediate said first and second ends thereof to adjust the initial stress thereof, and a cover adapted to be secured to said side for retaining said leaf springs and said setscrews in said recesses.

2. A commutator brush holder for an electric motor comprising a brush holding member consisting of an elastic insulating material, said brush holding member having spring receiving recesses therein and groovelike recesses extending substantially at right angles to said spring receiving recesses, said groovelike recesses being initially unthreaded, said setscrews adapted to be pressed from one side of the brush holding member into said groovelike recesses so that the screw threads thereof will then be pressed into said unthreaded walls which are thus provided with corresponding screw threads, leaf springs adapted to be inserted into said spring receiving recesses

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from said side, and a cover adapted to be secured to said side for retaining said leaf spring and said setscrews in said recesses.

3. A commutator brush holder as defined in claim 1, in which the outer ends of said groovelike recesses are conically enlarged toward the outside and said setscrews consist of grub screws having slotted ends sunk into said groovelike recesses from said outer ends.

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