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METHOD OF SEATING COMMUTATOR BRUSHES

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1 Claim. (Cl. 51—306)

This invention relates to a novel method of seating or sanding-in commutator brushes on motors, generators and the like. It is further concerned with a novel abrasive composition adapted for use in the practice of my novel method of seating commutator brushes.

There are many designs of motors and generators that can not be tested or efficiently operated until the brushes have become fully seated and the commutator allowed to acquire its normal film. To reduce the time required for seating the brushes many units are assembled with sandpaper or other abrasive sheet material glued or otherwise secured to the commutators so that when the brushes are mounted in operating position in their holders with their contact surfaces in contact with the abrasive sheet material, rotation of the commutator sands the brush faces to the approximate curvature of the commutator surface. The abrasive material is then removed from the commutator and if necessary the commutator surface is washed to remove the glue or other adhesive material used to secure the abrasive material to the commutator during seating operations. This method is subject to certain obvious disadvantages. The radius of curvature of the face of a brush so ground in all cases is slightly larger than that of the commutator and this difference is particularly large when the commutators are of small diameters. Furthermore, the abrasive particles leave grooves of appreciable depth in the brush face. Therefore, even though the brushes have been ground to the approximate contour of the periphery of the commutator, a long run-in period is still required to secure full brush contact and a polished brush surface. As normal brush wear, particularly for small commutators, averages between 30 and 40 thousand hours per inch of brush, the time of wear-in, even after sanding, can obviously be measured in hours. When this method is employed, the commutator must be turned by hand or by auxiliary motive power as the brushes are not in electrical contact with the commutator.

Another method which has been proposed for decreasing the time necessary for seating commutator brushes comprises holding a piece of abrasive material such as pumice stone against the revolving commutator and relying on the particles of abrasive which adhere to the commutator to sand the brushes into full contact with the commutator. This method is seldom used because the abrasive material cuts undesirable grooves in the commutator and the brushes. In addition, most of the abrasive particles are thrown from the commutator before coming in contact with the brush surface.

It is therefore an object of this invention to provide a novel means whereby the brushes may be fully, accurately and quickly seated or sanded-in with minimum expenditure of labor.

A further object of the invention is to provide a novel method of seating commutator brushes whereby the surface of the commutator will not be unduly injured and wherein there will be no need for subsequently taking positive steps to remove the abrasive material from the commutator.

A further object of the invention is to provide a mild abrasive composition that will adhere to the surface of commutator or armature only long enough to sand-in or seat the brushes.

I have discovered that the above and further objects which will become apparent from the following description of my invention can be attained by applying to the brush-contacting surface of the commutator a mixture of a mild, substantially non-conducting abrasive such as finely-divided pumice stone or alundum and a low melting point, non-conducting binder which, in small quantities, may be described as being volatile or fugitive at slightly elevated temperatures. My preferred binder is paraffin wax such as the commercial wax known as 125-127 grade paraffin which has a melting point between 125 and 127 deg. F. Other grades of paraffin or other mineral waxes, such as ceresin wax, which will hold the abrasive material on the commutator for a short time and will then evaporate at commutator temperatures without undue carbonization, may also be used. Ordinarily, to meet these requirements, the binding wax should have a melting point between 100 and 150 deg. F. with the higher melting point waxes being used in the warmer climates.

A composition consisting of a mixture of 80 parts pumice stone flour and 70 parts 125-127 paraffin has been found to be particularly adapted for use in the general practice of my invention. The pumice stone flour is thoroughly mixed with the melted paraffin and the mixture is molded and cast into rod or other usable form. This mixture contains about as large a quantity of abrasive as the wax will hold and yet be readily castable.

When the abrasive wax composition is applied to the moving or stationary commutator with a light pressure it has no detrimental effect on the commutator but has the desired abrasive

effect on the brushes. A full contact of the brush with the commutator and a mirror-like contact surface on the brush is obtained after the commutator has been run under operating conditions for a few minutes. The heat produced by friction and commutation quickly and completely evaporates the paraffin or similar wax binder at about the time the brushes have been seated and the wax-free abrasive which has served its purpose is then thrown from the revolving commutator. No further cleaning of the brush or commutator is necessary.

By means of my invention, the time required for seating commutation brushes is a matter of minutes as compared with hours for prior methods. Only small amounts of inexpensive materials are needed and as the abrasive is applied to the commutator under operating conditions the exact amount required may be easily determined from the immediate effect of the abrasive on the brush surface and hence on the operating characteristics of the particular electrical machine being serviced.

What I claim as new and desire to secure by Letters Patent of the United States is:

The method of seating commutator brushes of a dynamo electrical machine which comprises running the dynamo electric machine under electrically operating conditions with the commutator brushes in electrical contact with the commutator and applying to the brush-contacting surface of the rotating commutator a mixture of finely-divided pumice stone flour and a mineral wax which is fugitive at the electrically operating temperatures of said commutator.

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