(No Model.)

A. S. COOK.

BRUSH FOR DYNAMOS.

No. 444,794. Patented Jan. 13, 1891.

Fig. 1.

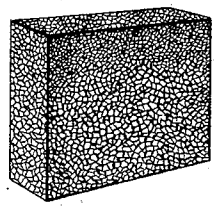


Fig. 2.



Witnesses.

Laurity W. Möller.

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Inventor.

Almerin S. Cook
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ALMERIN S. COOK, OF CAMBRIDGE, MASSACHUSETTS, ASSIGNOR TO HOSEA W. LEACH, TRUSTEE, OF SAME PLACE.

BRUSH FOR DYNAMOS.

SPECIFICATION forming part of Letters Patent No. 444,794, dated January 13, 1891.

Application filed March 28, 1890. Serial No. 345,913. (No model.)

To all whom it may concern:

Be it known that I, ALMERIN S. COOK, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented a new and useful Brush for Dynamos, including Motors, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective, and Fig. 2 an elevation, of one form of brush embodying my invention.

My invention relates to brushes for the commutators of that class of machines which are commonly called "dynamos" when used for converting power into an electric current, but motors when used for converting an electric current into power. These brushes were commonly of metal until lately, when blocks of carbon coated or plated with copper on about half their surface have been used instead. These carbon blocks, usually about two inches square and half an inch thick, stand edgewise to the commutator and are pressed upon it by spring-pressure. While in many respects an improvement upon the metal brushes, they produce a grating, disagreeable noise, wear away with undue rapidity, and also wear away the commutator much too rapidly.

My invention is a carbon brush from which the gases occluded in its porosities are dispelled in large part, and with its porosities filled in large part with a heavy or non-volatile oil.

In practicing my invention I take the carbon brush as it was made before my invention—that is, as a block of carbon with a thin plating of copper on a little more than half its surface—and heat it, preferably red-hot or white-hot, and then immerse it in a mineral lubricating-oil, the quantity of the oil being such that it is not sufficient to suddenly cool the carbon block, but the heat of the block heats the oil quite hot. The block is allowed to remain in the oil a few minutes—say ten or fifteen—but not long enough for the oil and block to cool to atmospheric temperature, when the block or brush is taken out of the oil and allowed to cool. Before the block is taken out the oil has passed well into its porosities, for the heating of the block has rarefied the gases in these porosities and the immersion in the oil has reduced the temperature so much that the rarefied gases have greatly decreased in volume and the oil has partly filled the spaces which were occupied by the gases before the block was heated, the subsequent cooling after the block is taken out of the oil causing the oil on and near the surface of the block to disappear, leaving the carbon brush on its surface much the same as before it was treated, but radically changed in that its porosities previously occupied by gases are now well filled with oil.

The most marked difference in appearance between my brushes and the carbon brushes heretofore used is that mine are darker and look denser. There is also a marked difference in weight; but the most striking differences appear in use, for the harsh noise of the old carbon brushes is not heard at all when my brushes are used. One of my brushes will last for months, while the old carbon brushes will not last a week, and the surface of the commutator is apparently not worn at all by my brush, while it is visibly worn by the old style. After a few hours' use the contact-surface of one of my brushes is beautifully polished with a fine black luster. The conductivity is apparently somewhat greater. I have also treated the carbon brushes by immersing them in hot oil, leaving the brushes in the hot oil for ten or fifteen minutes, or until the gases are displaced. When a brush is first immersed, bubbles will rise from it, showing, as I suppose, that the gases contained in the porosities of the brush are rarefied by heat and escape. When the brushes are taken out of the hot oil and allowed to cool, the oil on the surface disappears, as before. It might seem that the mere soaking of the carbon brush in the oil without heat would answer, but such is not the fact. The heat is essential, for if the brush with the oil absorbed in it be not heated it will be practically worthless, according to my experience.

My theory is that the gases in the carbon block or brush must be rarefied by heat, and that the oil which is absorbed by the block must be set or fixed in some way by heat; but whatever be the true theory, the fact is that in order to make my new brush the oil must be hot when in the carbon, or what is the same thing, heated after it is in the carbon.

What I claim as my invention is—

A carbon brush for dynamos and motors, the pores of which are filled with oil, substantially as set forth.

ALMERIN S. COOK.

Witnesses:
J. E. MAYNADIER,
EDWARD S. BEACH.