July 6, 1943. E. N. JACOBI 2,323,399

SPARK PLUG SHIELD

Filed Nov. 15, 1941

Fig. 1.

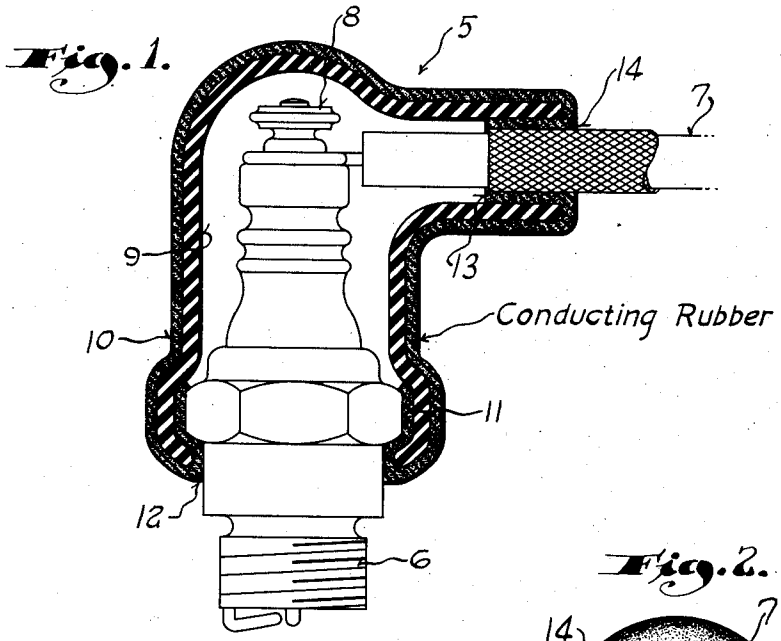


Fig. 2.

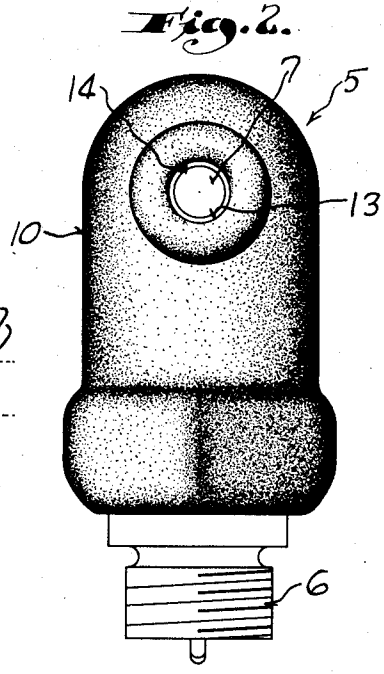
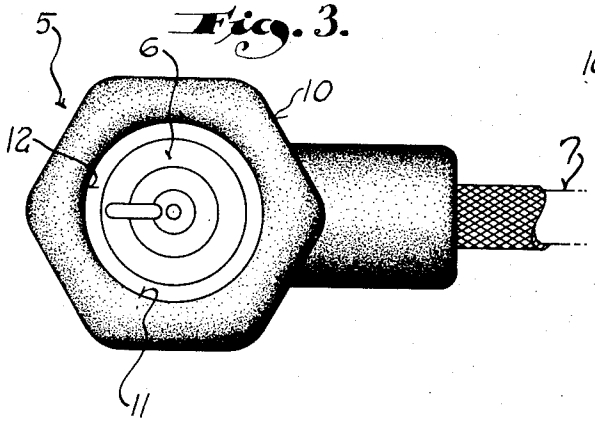


Fig. 3.



Inventor

Edward N. Jacobi

By Dewitt & Jones

Attorneys

Patented July 6, 1943 2,323,399

UNITED STATES PATENT OFFICE

2,323,399

SPARK PLUG SHIELD

Edward N. Jacobi, Milwaukee, Wis., assignor to Briggs & Stratton Corporation, Milwaukee, Wis., a corporation of Delaware

Application November 15, 1941, Serial No. 419,250

10 Claims. (Cl. 123—169)

This invention relates to shields for electrical appliances, and refers particularly to electrostatic and electromagnetic shields for spark plugs.

As is well known to those skilled in the art, it is desirable to shield the spark plugs of internal combustion engines to prevent their causing interference to radio reception. Heretofore these shields have been made of metal. An illustration of the type of shield in common use may be found in Patent No. 2,151,112 issued to Edward N. Jacobi, March 21, 1939.

Such metal shields are expensive to manufacture and difficult to apply. It is, therefore, an object of this invention to provide a simplified spark plug shield capable of being quickly and easily applied.

Another object of this invention is to provide a shield of the character described which although composed entirely of rubber, has electrostatic and electromagnetic shielding qualities.

With the above and other objects in view which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended calims, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claims.

The accompanying drawing illustrates one complete example of the physical embodiment of the invention constructed according to the best mode so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a cross sectional view through a shield embodying this invention, illustrating the same applied to a spark plug;

Figure 2 is an end view thereof; and

Figure 3 is a bottom view thereof.

Referring now particularly to the accompanying drawing in which like numerals indicate like parts, the numeral 5 designates generally a hood-like enclosure adapted to be applied to a spark plug 6 and to accommodate the shielded lead 7 which is connected to the terminal 8 of the plug.

The hood-like enclosure 5 has a laminated wall the inner layer 9 of which is formed of ordinary soft insulating rubber while the outer layer 10 thereof is formed of a rubber material recently developed and known to the trade as "conducting rubber."

Such "conducting rubber" is described in "India Rubber World 100:6," page 38, September 1939; and in "Rubber Age 47," page 308, August 1940. As described in these articles conducting rubber can be made with a resistance as low as 1 ohm per cubic centimeter of rubber. As will be apparent conducting rubber of low resistance is most desirable for the attainment of good electrostatic shielding qualities.

This material has all the characteristics of ordinary rubber except that it is impregnated with a metallic substance to render the same electrically conductive.

The two laminations are vulcanized or otherwise secured together and to insure an electrical grounding connection between the outer lamination of conducting rubber with the metal base of the plug and the metal covering of the shielded lead, the outer lamination is turned in over the openings in the enclosure through which the plug and lead pass.

Thus the inturned portion 11 of conducting rubber which bounds the edge of the opening 12 through which the plug passes, snugly engages the nut of the spark plug base, while the inturned portion 13 which bounds the opening 14 through which the lead passes firmly grips the metal sheath of the shielded lead 7.

Being formed of rubber as it is, the hood-like enclosure is readily pulled onto the spark plug and fitted to the shielded lead, and as will be readily apparent to those skilled in the art, the shield thus formed not only serves as an effective electrostatic and electromagnetic barrier to preclude radio interference, but also serves to protect the plug from the elements.

What I claim as my invention is:

1. An electrostatic shield for electrical appliances such as spark plugs comprising: a hood adapted to fit over the appliance and formed essentially of rubber with the outer layer thereof composed of conducting rubber and the inner surface electrically insulating.

2. A shield for spark plugs and the like comprising: a hood formed of rubber and of a size to fit over a spark plug and the adjacent end portion of its lead, the inner surface of said hood being electrically nonconducting, and at least the outer surface of the hood having electrical conducting characteristics.

3. A shield for spark plugs and the like comprising: a hood shaped to fit over the plug and over the adjacent end portion of its lead, said hood being formed essentially of rubber and having a laminated wall, the inner lamination of which is a good insulator, and the outer lamination of which is of conducting rubber.

4. A shield for spark plugs and the like comprising: a hood shaped to fit over the plug and

over the adjacent end portion of its lead, said hood being formed essentially of rubber and having a laminated wall, the inner lamination of which is a good insulator, and the outer lamination of which is of conducting rubber, said outer lamination extending around the edges of the openings in the hood through which the spark plug and its lead pass so as to have electrical contact with the metal portions of the spark plug base and the external covering of the lead.

5. An electrostatic shield for electrical appliances such as spark plugs comprising: a hollow body adapted to fit over the appliance, said body having openings through which metallic parts of the appliance enter the interior of the body; and elastic portions on the body bounding said openings and of a size to snugly grip the metallic parts received therein and thereby securely position the shield on the appliance, said body and its elastic portions having a continuous electrical conducting layer which is exposed at the insides of said elastic portions to have electrical contact with the metal parts gripped thereby.

6. A shield for spark plugs and the like comprising: a one-piece rubber hood of a size to fit over a spark plug and the adjacent end portion of its lead, said rubber hood comprising a continuous layer of conducting rubber adapted to enclose the spark plug and having elastic portions formed to resiliently grip the metal portions of the spark plug base and the external covering of the lead so as to electrically connect said portions of the base and lead.

7. A shield for spark plugs and the like comprising: a one-piece rubber hood of a size to fit over a spark plug and the adjacent end portion of its lead, said rubber hood comprising a continuous layer of conducting rubber adapted to enclose the spark plug and having elastic portions formed to resiliently grip the metal portions of the spark plug base and the external covering of the lead so as to electrically connect said portions of the base and lead; and means for electrically insulating the live parts of the plug and its lead from the conducting surfaces of the hood.

8. A shield for spark plugs and the like comprising: a hood formed of rubber and shaped to fit over the plug and over the adjacent end portion of its lead, said hood having elastic portions for yieldingly gripping the metal portions of the spark plug base and the external covering of the lead; and conducting surfaces at the exterior of the hood and surrounding the plug and the adjacent end of its lead; said conducting surfaces extending into the elastic gripping portions of the hood to be held in good electrical contact with the metal portions of the plug base and lead covering by the elasticity of said elastic portions.

9. A shield for spark plugs and the like comprising: a hood having elastic electrical conducting portions for gripping the metal parts of the spark plug base and the covering for its lead; and a body joining the elastic portions and having an electrically conductive layer for enclosing the plug and for electrically connecting said elastic portions.

10. A shield for spark plugs and the like comprising: a hood having elastic electrical conducting portions for gripping the metal parts of the spark plug base and the covering for its lead; a body joining the elastic portions and having an electrically conductive layer for enclosing the plug and for electrically connecting said elastic portions; and a lining of non-conducting material on the interior of the body at least at the region of the spark plug terminal.

EDWARD N. JACOBI.