Aug. 22, 1950 A. A. PIERSON, JR 2,519,850

RADIO SHIELDING SEALING GASKET

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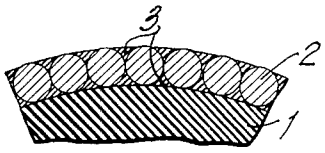


FIG. 3

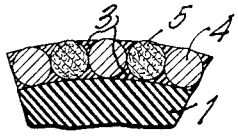


FIG. 4

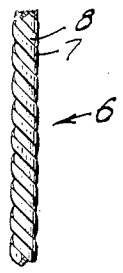


FIG. 5

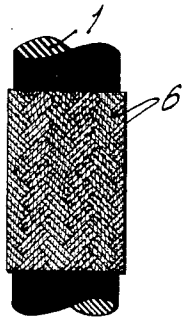


FIG. 1

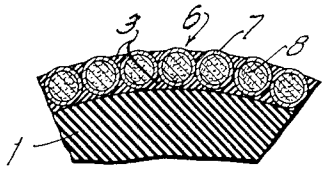


FIG. 2

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RADIO SHIELDING SEALING GASKET

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2 Claims. (Cl. 174—35)

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In the ignition systems of internal combustion engines used in airplanes, motor vehicles and the like, high tension current passes within the distributor in the form of a spark between a central or main terminal and a terminal for each cylinder in the engine. These terminals between which the sparks occur are enclosed in the distributor by a cap which fits over the body thereof and, in the case of airplanes, both the body and the cap are of metal. To prevent interference with the radio with which such vehicles are equipped it is necessary to prevent the waves generated by these sparks from passing outside of the distributor. Furthermore, it is not only essential that entrance of water between the cap and the body of the distributor be prevented but also air leakage from the interior of the distributor, because the air pressure within the distributor used in planes that rise to high altitude must be maintained substantially higher, by supercharging, than the pressure of the circumambient air.

It is a relatively simple matter to prevent the electro-magnetic waves generated by the sparks aforesaid from passing outside the distributor by providing a substantially continuous metal contact between the cap and the body of the distributor. It is also a rather simple matter to provide a substantially air tight contact between the distributor cap and body so that an air pressure which is substantially higher than that of the circumambient air can be maintained within the body of the distributor. However the problem of providing good electrical contact between the cap and the body of the distributor, which involves the use of metal in some form or other, and, at the same time, forming an air tight contact between the cap and the body of the distributor is somewhat more difficult of solution. A gasket which can be used to effect such a combined radio shield and air seal must be adapted to be manufactured rapidly at comparatively low cost; must be yielding, and preferably resilient to an appreciable degree to conform to and thereby form an air tight seal with the surfaces between which it is positioned; must be air impervious; and must provide a substantially continuous metallic contact between the cap and body of the distributor.

It is the principal object of my invention to provide such a gasket and I accomplish this result by forming the gasket in the manner described below and illustrated in the accompanying drawing in which:

Fig. 1 is a fragmentary elevation view to a greatly enlarged scale of my preferred form of gasket;

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Fig. 2 is a fragmentary cross section of my preferred form of gasket to a still greater enlarged scale;

Figs. 3 and 4 are fragmentary sections similar to Fig. 2 showing modified types of gaskets; and

Fig. 5 is a fragmentary elevation view to an enlarged scale of one of the elements forming my preferred type of gasket.

Referring to the drawings

1 represents the core of the gasket which is preferably cylindrical and formed of rubber, or preferably "Neoprene" or some similar substance which is resilient and deformable, so that it can function as a gasket, and yet more resistant to the action of oils and greases than is rubber.

Wrapped around this core is a plurality of electrical conductors having closely spaced portions thereof exposed on the surface of the gasket so as to provide a substantially continuous electrical contact between the two metallic surfaces between which the gasket is compressed. These conductors are preferably braided together as shown at 6 in Fig. 1. The preferred form of conductor is shown in Fig. 5 and comprises a core 8 of fibrous material such as thread or yarn around which is helically wrapped a very thin gauge, flat, metal ribbon 7. In Fig. 3, however, I have shown a wrapping formed entirely of metal conductors 2 which may be very fine wires. It is to be understood that the conductors which are wrapped about the core are extremely tenuous and are not intended to, and do not, function as an armor or protection for the core, but only to provide electrical conductivity between opposite sides of the gasket substantially throughout.

In Fig. 2, I have shown a gasket formed by wrapping a plurality of conductors 6, such as shown in Fig. 5, around a core 1 of rubber, neoprene or the like. Here, it will be apparent that the metal ribbons 7 which are wrapped around the threads 8 are exposed on the surface of the gasket.

In Fig. 4 I have shown a wrapping comprising wires 4 and threads of yarns 5. As here shown, the wires and threads alternate, but it is to be understood that groups of two or more wires and groups of two or more threads may be braided together; the important thing being that closely spaced portions of the wires, or other conductors employed, be exposed on the surface of the gasket to provide substantial continuity of electrical contact between two metallic surfaces in contact with said gasket but on opposite sides thereof.

As thus formed, it will be apparent that none of the gaskets when compressed will be absolutely air impervious because of the interstices which exist between the conductors themselves, between the conductors and the core and in the yarns or threads if such are employed.

Therefore, in order to make the gasket air impervious throughout I immerse it or run it through a dispersion or a solution of an air impervious material, such for example, as rubber or latex, in a suitable solvent so that all of the interstices in the gasket are filled thereby as shown at 3 in Figs. 2, 3 and 4. When the gasket is removed from the impregnating bath the solvent evaporates leaving the interstices filled with air impervious material. The film of rubber or other air impervious material used in impregnating which adheres to the surfaces of the conductors which are exposed on the surface of the gasket may be removed by suitable wipers or, preferably, by drawing the material through a die.

As pointed out above the drawings are to a greatly enlarged scale, and while the invention is not limited to any particular size of gasket it may be understood that, in practice, the overall diameter would not ordinarily exceed about ⅛".

What I claim is:

1. A radio shielding and sealing gasket comprising a core of resilient material in the center thereof, a plurality of metallic conductors, comprising thin, flat, metal ribbons helically wrapped about tenuous strands of yieldable material, closely braided around said core and having closely spaced, bare portions of said ribbons exposed substantially throughout the entire surface of said gasket, and the interstices of said gasket being substantially filled with a resilient, air-impervious substance preventing passage of air transversely through said gasket; whereby, when said gasket is compressed between two surfaces spaced thereby, said surfaces will be in substantially continuous electrical contact through said gasket and the space between said surfaces will be effectively sealed against the passage of air and moisture in the zone of said gasket.

2. A radio shielding and sealing gasket comprising a core of resilient material, a plurality of electrical conductors, comprising tenuous strands of fibrous material having thin, flat, metal ribbons helically wrapped about them, braided closely together around said first mentioned core with closely spaced, bare portions of said ribbons exposed on the surface of said gasket, and the interstices in said gasket being substantially filled with a yielding, air-impervious material preventing passage of air transversely through said gasket; whereby, when said gasket is compressed between two surfaces spaced thereby said surfaces will be in substantially continuous electrical contact through said gasket and the space between said surfaces will be effectively sealed against the passage of air and moisture in the zone of said gasket.

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