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GASKET FOR ENGINE PARTS

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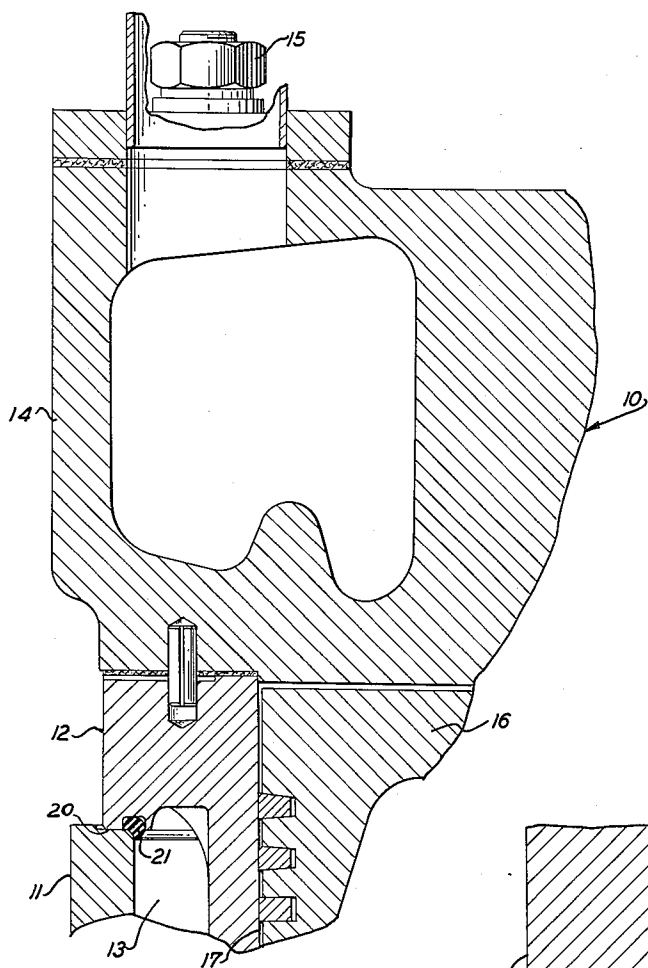
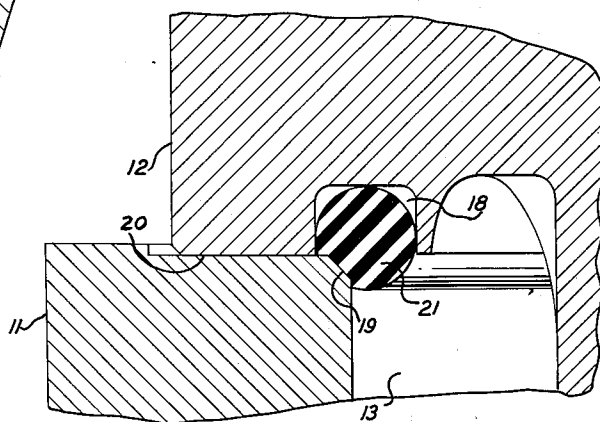


FIG. 2



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1

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GASKET FOR ENGINE PARTS

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4 Claims. (Cl. 123—193)

This invention relates to the construction of an internal combustion engine and more particularly to the use of an electrically nonconductive seal between adjacent engine parts of dissimilar metals open to or bordering upon a common coolant chamber. The seal inhibits galvanic corrosion at the interface between the engine parts and also acts as a coolant seal to prevent leakage between them.

One of the applications of this invention is in aluminum engines wherein a wet sleeve type ferrous alloy cylinder liner is mounted in an aluminum block. The cylinder liner and the block have interface contacts and form together passages for coolant. Galvanic corrosion takes place at the interface of the block and the liner because of the use of dissimilar metals which are in contact with an electrically conductive coolant acting as an electrolyte. With the aluminum acting as the anode and the liner acting as the cathode, an electrical current of appreciable intensity flows with the aluminum being dissolved.

One of the prime objects, therefore, of the applicant's invention is to provide means which inhibits or reduces galvanic corrosion to a minimum.

Another object of this invention is to provide means by which the interface of two dissimilar materials in contact with a common liquid source is sealed from the liquid.

In the applicant's arrangement the intensity of the electrical current flowing between the block and the liner is decreased considerably by increasing the resistance to the electrical current. This is done by providing an electrically nonconductive seal in the form of an O-ring or equivalent structure at the edge of the interface at which the coolant flows. The coolant is prevented from leaking through the interface and the electrical current flowing between the aluminum block and the alloy liner travels a greater distance and in a circular path thereby reducing its intensity to an acceptable value.

An annular slot or groove is provided in one or the other or both of the interfaces adjacent to the water passage. One of the members is arranged so that there is an overlapping of the groove in the other member thereby securing the seal in position in the groove and under a predetermined stress. As a result of this arrangement, the seal is anchored securely in place and protects the groove as well as the interface from the coolant.

Other objects and advantages of this invention will become apparent as this description proceeds.

Figure 1 is a transverse section taken through a portion of an engine and showing a construction embodying the applicant's invention; and

Figure 2 is an enlarged transverse section taken through a portion of the cylinder liner and cylinder block and showing the applicant's construction.

Referring now to the drawings and in particular to Figure 1, reference numeral 10 indicates generally portions of the cylinder head, cylinder liner, cylinder block, and piston of an internal combustion engine. This

2

engine comprises an aluminum cylinder block 11 within which is supported a ferrous alloy cylinder liner 12. Upon being assembled, the block 11 and cylinder liner 12 have a common interface 20 and form a conventional coolant passage 13 through which the coolant flows to remove combustion heat. This construction is generally known as a wet sleeve construction. A cylinder head 14 is also shown in part and is secured to the cylinder block by conventional bolt means 15. A piston 16, also shown in part, reciprocates within cylinder liner 12 along the surface 17 in the usual manner.

In the particular embodiment shown in enlarged section in Figure 2, cylinder liner 12 is provided with an annular groove 18 at one end of the interface 20. Although the groove 18 is shown in the cylinder liner 12, it is obvious that it may be provided for in the aluminum block portion as well or in both. In the particular construction shown in the drawings, the groove 18 is overlapped partially by a corner portion of the cylinder block at the interface. This portion of the cylinder block is provided with a chamfered edge 19. The sealing member 21 which may be in the form of an O-ring is initially placed in the annular groove 18. When the liner 12 is mounted upon the cylinder block 11 with the members in contact at the interface 20, chamfered edge 19 partially overlaps the annular groove 18 and compresses the sealing member 21 to hold it in position in the groove 18. Coolant, therefore, in the passage 13 cannot enter the annular groove 18 nor can it get to the interface 20, thereby sealing the interface from coolant. The electrical current between the cylinder block 11 and the liner 12 is forced to flow about the surface of the sealing member 21. Because of the greater distance the current must travel, the current intensity is materially diminished with a concomitant reduction in the severity of the galvanic corrosion.

It will be understood that the invention is not to be limited to the exact construction shown and described but that various changes and modifications, such as the omission of chamfer 19 or changing it to radius, may be made without departing from the spirit and scope of the invention as defined in the appended claims.

I claim:

1. An internal combustion engine having a cylinder liner and a cylinder block made of dissimilar metals and having an interface connection adjacent to a coolant passage, a groove in one of said cylinder liner and cylinder block at the interface connection adjacent to the coolant passage with the other of said cylinder liner and cylinder block partially covering said groove, a sealing member disposed in said groove whereby the coolant is prevented from contacting the interface connection by said sealing member.

2. In an internal combustion engine, a ferrous alloy sleeve, an aluminum alloy cylinder block, said sleeve being mounted upon said block whereby said block and said sleeve have an interface connection, said block and said sleeve when assembled forming a part of the liquid cooling passages of the engine, a groove disposed in the liner adjacent to the interface, said block adjacent to the interface connection extending inwardly into the liquid cooling passage and partially covering the groove, a sealing member disposed in said groove and having a portion of its surface extending outwardly beyond said groove whereby the mounting of said cylinder liner upon said cylinder block results in the compression of the sealing member by the block thereby sealing the interface connection from the liquid in the fluid cooling passage.

3. Means for sealing an interface connection between members having an interface connection adjacent to a liquid chamber, said means comprising a groove formed

3

in one of said members adjacent to the interface connection and the liquid chamber with the other of said members partially covering said groove and a sealing member disposed in said groove whereby the bottom of the groove and said interface connection are sealed off from the liquid.

4. In an internal combustion engine, a sleeve, a cylinder block, said sleeve being mounted upon said cylinder block to form a portion of the liquid cooling passages of the engine, said block and said sleeve having at least one interface connection adjacent to the liquid cooling passage of the engine, a groove provided at the interface connection in one of said blocks and said sleeves, said

4

groove being disposed inwardly of the liquid passage compartment, an O-ring disposed in said groove, said O-ring having a portion of its surface extending outwardly of said groove whereby said O-ring is compressed and secured in said groove upon the mounting of said liner upon said block.

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