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SPARK PLUG THREAD LUBRICANT

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8 Claims. (Cl. 252—29)

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My invention relates to lubricants for use on spark plug threads. Such compositions are mixtures of a finely divided solid lubricant with a lubricating oil, petrolatum, or grease, in which a major function of the solid lubricant is to remain in place after the thermal decomposition or volatilization of the hydrocarbon, in order that the spark plug may be removed when desired.

The heretofore preferred composition, which has become accepted as standard, is a mixture of two parts powdered mica with three parts viscous paraffin-base lubricating oil. This has given satisfactory performance in many cases, but it has failed completely in the case of high-compression engines burning aromatic fuels, in which quite often such extreme force has been required to remove spark plugs that cylinder-head threads have been damaged. I have been unable to determine with certainty the cause of this failure, but I believe that the high temperatures of combustion cause the heavy paraffinic oil to leave, upon decomposition, a hard and extremely tenacious form of carbon which cements the mica crystals to one another and to the metal surfaces.

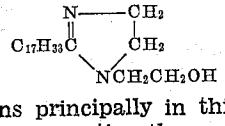
The following new composition has been found to function satisfactorily as a spark plug thread lubricant in all types of spark-ignited engines, including those employing aromatic fuels:

	Percent by weight
Naphthenic oil	59
Mexican plumbago	39
"Amine 220"	2

In this preferred formula, the oil is a wholly distilled, naphthene-base lubricating oil having a gravity of about 20.4° A. P. I. and a Saybolt Universal viscosity of about 360 seconds at 100° F.

The Mexican plumbago is a naturally occurring material consisting of approximately 85% graphite and 15% clay, which is ground so finely that 100% passes through a 100-mesh screen and at least 92% passes through a 325-mesh screen. The clay is not, as might be supposed, a deleterious impurity; I believe it contributes substantially to the effectiveness of the composition.

"Amine 220" is a product of the Carbon and Carbide Chemical Co., identified as 1-hydroxyethyl-2-heptadecenyl Glyoxalidine:



which functions principally in this composition as an agent for preventing the separation of the

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solid and liquid phases during storage of the compound.

Considerable variation from the above formula is permissible, depending upon the consistency desired in the finished product. However, the plumbago should constitute 30% to 50% of the whole, and the "Amine 220" should be from 0.5% to 5.0% of the whole. The naphthenic lubricating oil should have a gravity of between 19.5° and 21.5° A. P. I. and a viscosity of 200 to 400 seconds S. U. at 100° F. Other forms of finely divided graphite may be substituted for the Mexican plumbago, but I prefer not to eliminate the naturally occurring clay.

In the attempt to find equivalents for "Amine 220" I have tested numerous commercially available dispersing agents, but I have found none which consistently inhibits separation of the oil from the graphite to an adequate degree. However, it is apparent that substances closely similar to "Amine 220" in chemical structure, although not readily available at present, are capable of replacing "Amine 220" in the composition.

I claim as my invention:

1. A spark plug thread lubricant comprising: 30 to 50 per cent by weight of a solid lubricant consisting predominantly of graphite, 0.5 to 5.0 per cent by weight an oil-soluble hydroxy heterocyclic amine the molecular weight of which is between 300 and 400, and the remainder a naphthene-base lubricating oil.

2. A spark plug thread lubricant comprising: 30 to 50 per cent by weight a clay-bearing plumbago, 0.5 to 5.0 per cent by weight an oil-soluble hydroxy heterocyclic amine the molecular weight of which is between 300 and 400, and the remainder a naphthene-base lubricating oil.

3. A spark plug thread lubricant comprising: 25 to 42 per cent by weight graphite, 4.5 to 7.5 per cent by weight clay, 0.5 to 5.0 per cent by weight an oil-soluble hydroxy heterocyclic amine the molecular weight of which is between 300 and 400, and the remainder a naphthene-base lubricating oil.

4. A spark plug thread lubricant comprising: 30 to 50 per cent by weight of a solid lubricant consisting predominantly of graphite, 0.5 to 5.0 per cent by weight an oil-soluble hydroxy heterocyclic amine the molecular weight of which is between 300 and 400, and the remainder a naphthene-base lubricating oil having a gravity between 19.5 and 21.5 degrees A. P. I.

5. A spark plug thread lubricant comprising: 30 to 50 per cent by weight clay-bearing plumbago, 0.5 to 5.0 per cent by weight an oil-soluble

hydroxy heterocyclic amine the molecular weight of which is between 300 and 400, and the remainder a napthene-base lubricating oil having a gravity between 19.5 and 21.5 degrees A. P. I.

6. A spark plug thread lubricant comprising: 30 to 50 per cent by weight of a solid lubricant consisting predominantly of graphite, 0.5 to 5.0 per cent by weight of 1-hydroxyethyl 2-heptadecenyl glyoxalidine, and the remainder a naphthene-base lubricating oil.

7. A spark plug thread lubricant comprising: 30 to 50 per cent by weight of a solid lubricant consisting predominantly of graphite, 0.5 to 5.0 per cent by weight of an oil-soluble hydroxy heterocyclic amine the molecular weight of which is between 300 and 400, and the remainder a distilled hydrocarbon lubricating oil.

8. A spark plug thread lubricant comprising: 30 to 50 per cent by weight of a solid lubricant consisting predominantly of graphite, 0.5 to 5.0 per cent by weight of an oil-soluble hydroxy heterocyclic amine the molecular weight of which is between 300 and 400, and the remainder a lubricating oil.

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REFERENCES CITED

The following references are of record in the file of this patent:

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