252. COMPOSITIONS.
104
Cross Reference
solvent + oxidizer
Examiner
160

UNITED STATES PATENT OFFICE.

CARLETON ELLIS AND ALFRED A. WELLS, OF MONTCLAIR, NEW JERSEY.

GASOLENE-ENGINE-CYLINDER CLEANER.

1,310,985. Specification of Letters Patent. Patented July 22, 1919.

No. Drawing. Application filed May 4, 1917. Serial No. 166.334.

To all whom it may concern:

Be it known that we, CARLETON ELLIS and ALFRED A. WELLS, citizens of the United States, and residents of Montclair, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Gasolene-Engine-Cylinder Cleaners, of which the following is a specification.

This invention relates to an engine cylinder cleaner and to a process of cleaning the cylinders of gasolene engines, all as more fully hereinafter described.

In the cleaning of carbon from gasolene engine cylinders and the like it has been customary to use some simple crude mixture such for example as kerosene and the results obtained have not been very satisfactory for one reason because after charging into the cylinder a quantity of such liquid material, it becomes very difficult to start the engine thereafter. It is necessary in many cases to introduce the liquid into a hot engine and to allow it to act only for a short time as otherwise the engine would become cold and starting would be difficult or almost impossible. Hence it is not desirable to apply such a liquid to a hot engine and allow to stand over night because of the starting difficulties with a cold engine. A satisfactory cylinder cleaner should contain a readily ignitible body serving as a priming agent.

Another desideratum is that the liquid applied should posses a relatively strong action on binder of the carbon accumulations of carbon in automobile engines, cylinders, etc. Furthermore, there may be advantageously present a body possessing an oxidizing character which would tend to assist in the disintegration of carbon.

According to the present invention a strong loosening or disintegrating agent for the binder of the deposited carbon masses is employed, such solvent being preferably acetone, methyl acetone, methyl alcohol and the like, many of the lower boiling products obtained by wood distillation and of an alcoholic nature being considerably more active then ethyl or denatured alcohol for this purpose, although the latter may be used in part at least, in some cases. With such a solvent medium or mixed solvent as a basis there may be added according to one phase of the invention an igniting agent, namely, a body of very low flash point, such as carbon bisulfid or 88° gasolene. The ignition material should be miscible with the alcohol solvent to secure the best results and as heavier gasolenes are not thus miscible except with the aid of special agents such as fusel oil they are not as satisfactory for the purpose besides not giving the requisite ignition effect secured by such a volatile gasolene as one of possibly 88 or 90° B. Approximately 1 volume of this light gasolene may be mixed with 2 volumes of methyl alcohol or methyl acetone, forming a clear solution which may be used as a cylinder cleaner.

Another phase of the preferred form of the invention involves the addition of an oxidizing agent which is sufficiently soluble in the liquid vehicle to enable a substantial amount of the said agent to be carried to the carbon material. The effect in this case is that such oxidizing agent is carried into the mass of carbon and on starting up the engine the carbon is loosened or destroyed by the joint action of the solvent and by oxidation and combustion of the carbon. The carbon bisulfid or light gasolene substance probably assists in carrying the oxidizing agent to the carbon and in effecting penetration through the pores and cracks thereof and behind the carbon masses and the walls of the cylinder so that the carbon may be forcibly blown off from the walls when ignition occurs. In some cases only a small amount of the oxidizing agent may be used to allow the carbon to burn out more slowly. From 3 to 5% of oxidizing agents such as ammonium nitrate ordinarily may be employed. Ammonium compounds have the advantage that they burn off without leav-

252. COMPOSITIONS. Cross Reference Examiner
104

ing any residue such as is likely to occur with sodium nitrate, and thus leave the cylinders free from any alkaline deposits. When ammonium persulfate is used the small amount of sulfur compounds introduced does no harm, the amount of sulfur present in this way being negligible so far as any corrosive effect on the cylinders is concerned, in fact a comparatively negligible quantity in comparison with the sulfur usually present in the gasolene in greater or less amount.

In using this composition one or two ounces or more is placed in the engine cylinders and the engine turned over without ignition, so as to get the composition well distributed through the cylinder chamber. After standing for a suitable length of time after the carbon is "softened" the engine is started and masses of carbon are blown out, a cloud of black smoke indicating the effective character of the action.

A salt of the character of ammonium nitrate is more readily soluble in methyl than in ethyl alcohol solvent mixtures as shown by the following tests:

5 grams of ammonium nitrate was found to require about 100 c. c. of denatured alcohol for solution, while 38 c. c. of ordinary wood alcohol dissolved 5 grams of the ammonium salt. The addition of carbon bisulfid to the wood alcohol solution precipitated some of the ammonium nitrate but on the addition of methyl acetone the nitrate went into solution again. Light gasolene was then added until the mixture started to show cloudiness. The final composition resulting in this test was in the proportion of ammonium nitrate 5 grams, methyl alcohol 38 c. c., carbon bisulfid 20 c. c., methyl acetone 35 c. c., and 88° gasolene 15 c. c.

It will be noted that the effect of the carbon bisulfid and gasolene is to precipitate the ammonium nitrate to a greater or less extent and therefore in order to have a considerable amount of nitrate present, a balanced solution containing a sufficient proportion of solvent for ammonium nitrate to bring about this result with enough carbon bisulfid or light gasolene added to serve in part at least as a priming component without being present in such quantities as to throw down the ammonium nitrate.

We also propose to add to the composition, in some cases, a certain amount of lubricating oil so as to leave the walls of the chamber lubricated to some extent and thus improve the initial compression at the time of starting so that the engine is started with greater ease. 10% or so of lubricating oil may be used.

To recapitulate, the present invention involves: (1) The use of a strong loosening agent for cylinder carbon incrustations and especially some of the members of the wood alcohol group and allied compounds of a very light and volatile character, including methyl alcohol, methyl acetone and ordinary acetone; (2) preferably incorporated with an inflammable body of low flash point such as carbon bisulfid or a light hydrocarbon of the gasolene type miscible with said agent and of such a readily ignitible character as to serve as a priming substance when the engine is started; (3) preferably incorporated with an oxidizing agent, preferably one leaving no residue on ignition, such as ammonium persulfate or ammonium nitrate; it being understood that various modifications of the foregoing composition, omitting one or more elements thereof and varying the character of each of the elements of the preferred form of the composition as may be desired, including various additions of other light or heavy vehicles not herein mentioned but applicable hereto to a greater or less extent as components, or as additions which do not modify the general effect of the composition, but which may effect a cheapening thereof, as for example, the use of denatured alcohol and even of ordinary gasolene to some extent or to a considerable extent according to circumstances may not be precluded. Thus it is possible to make up certain mixtures with a heavy gasolene normally immiscible with alcohol so as to get a clear, well blended product. The use of ketones, amyl alcohol and acetate, etc., are effective for this purpose. However, it is the primary purpose of the invention to make as concentrated a carbon dislodging component as possible, compatible with securing reasonably good igniting results and preferably with the presence of an influential amount of an oxidizing agent. In some cases the composition may even be used solely as a priming agent if desired.

The process of the present invention for dislodging carbon from gasolene engine cylinders and cleaning the surfaces thereof involves the application of the foregoing composition to the surfaces of the cylinder, allowing the material to penetrate through the carbon masses, in starting the engine and blowing off the carbon material and allowing any residual oxidizing agent to burn off other portions of carbon still adhering to the cylinder.

What we claim is:—

1. A cylinder cleaner comprising a carbon dislodging agent, an igniting element and a solid oxidizing element comprising ammonium nitrate.

2. A cylinder cleaner which comprises a

carbon softener, an igniting agent and an oxidizing agent comprising ammonium nitrate.

3. A cylinder cleaner which comprises wood alcohol and ammonium nitrate.

4. A cylinder cleaner comprising an alcohol, and a ketone, incorporated with an igniting agent, and an oxidizing agent comprising an ammonium salt.

5. A cylinder cleaner comprising a volatile alcohol and ammonium nitrate.

6. A cylinder cleaner comprising alcohol, carbon bisulfid and an inorganic solid oxidizing agent soluble therein and capable of decomposition completely into gaseous bodies.

7. A gasolene engine cylinder cleaner comprising ammonium nitrate dissolved in a mixture of volatile highly inflammable organic solvents having a loosening action on carbon deposits.

CARLETON ELLIS.
ALFRED A. WELLS.