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REFINING LUBRICATING OIL

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My invention relates to improvements in the refining of lubricating oils. By "lubricating oils" I refer to those oils heavier than gas oil, heavier than about 35° Bé. and having viscosities upwards of about 50 at 100° F. Saybolt universal, which are commonly used for lubrication.

I have discovered that lubricating oils can be improved, particularly with respect to color and cast, by digestion at a temperature of about 500–600° F. while in contact with a comminuted solid absorbent such as fuller's earth in the presence of a maintained atmosphere of a non-oxidizing, or better a reducing, gaseous medium.

According to my invention, the fuller's earth, or other solid absorbent, is maintained in suspension in a bath of the oil heated to a temperature of 500–600° F. while a non-oxidizing, or better a reducing, gaseous medium is bubbled therethrough.

The gaseous media useful in carrying out my invention include hydrogen, carbon dioxide, nitrogen and pressure still tail gases. Pressure still tail gases, that is the gas mixture remaining uncondensed in operations carried out for the production of gasoline by cracking gas oil, for example, are particularly advantageous. The fuller's earth may be maintained in suspension in the bath by appropriately introducing the gas or gas mixture or by mechanical agitation or by both of these means.

Although I have referred to the operation as "digestion", it can be carried out in a continuous manner by supplying untreated oil and fresh absorbent to the bath and by discharging treated oil and spent absorbent from the bath as the operation proceeds.

The operation can be controlled by regulating the proportion of solid absorbent employed. About 8% by weight on the oil of fuller's earth of 100–200 mesh, for example, is usually satisfactory, although the proportion used may be more than 1% or less than 15%. The operation can also be controlled by regulating the time of treatment; which is usually an average of 2–5 minutes. The gaseous treating medium should be supplied at a rate sufficient to maintain the oil bath saturated therewith.

Following this treatment, the treated lubricating oil may be steamed to strip out any components absorbed from the gaseous treating medium; this step is particularly useful where pressure still tail gases are used as the gaseous treating medium.

I have observed in particular that my invention, applied to lubricating oils which would otherwise have a blue cast, tends to change the cast to a green. This improvement in the cast is effected at the same time that the color of the lubricating oil is improved.

I claim:

1. In the refining of lubricating oils, the improvement which comprises contacting the lubricating oil with a comminuted solid consisting solely of a non-metallic adsorbent at a temperature of about 500–600° F. for about 2–5 minutes in the presence of a maintained atmosphere of pressure still tail gases.

2. In the refining of lubricating oils, the improvement which comprises contacting the lubricating oil with a comminuted solid consisting solely of a non-metallic adsorbent at a temperature of about 500–600° F. for about 2–5 minutes in the presence of a maintained atmosphere of a reducing gas.

In testimony whereof, I have subscribed my name.

JAMES G. STAFFORD.