

UNITED STATES PATENT OFFICE.

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PROCESS OF PURIFYING LUBRICATING-OIL.

1,363,784.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CYRUS HOWARD HAPGOOD, a citizen of the United States, residing at Danvers, county of Essex, and State of Massachusetts, have invented a new and useful Improvement in Processes of Purifying Lubricating-Oil, of which the following is a full, clear, and exact description.

The object of my invention is to so treat used oil, especially crank case lubricating oil, as to remove the impurities, particularly carbon, therefrom and restore the oil to its originally uncontaminated condition. The invention is applicable to the purification of lubricating oil whether or not it contains gasoline, although the procedure, where it is necessary to remove gasoline as well as carbon, is somewhat modified. I shall first describe the process as used when it is desired to remove carbon and not gasoline.

To 100 gallons of dirty oil I add about three pounds of a readily saponifiable oil, such as oleic acid (red oil), which is miscible in all proportions with the mineral oil. I heat to about 180 degrees F. and mix thoroughly. Other saponifiable oils are available, such as the glycerids.

While maintaining the solution heated, I add an alkaline solution (say about one and one-half pounds of soda ash) of a sufficient concentration to completely saponify the oleic acid and form a counter colloid, which takes up the colloided carbon suspended in the oil. I also prefer to add a suitable salt (say about one and one-half pounds of sodium chlorid or sodium sulfate) to facilitate separation and prevent the formation of an emulsion. The soda ash, or soda ash and salt, should be dissolved in about nine gallons of water.

I then apply centrifugal force to remove from the lighter oil the heavier saponified matter or soap solution and the previously suspended carbon and dirt which has been transferred from the oil to the soap solution. The separation may be effected, with less thoroughness and rapidity, by gravity.

If the oil to be purified contains gasoline, I first proceed by blowing live steam or heated air into the dirty oil through the bottom of a tank containing the oil until the temper-

ature reaches 200° to 208° F. This distills off the gasoline and also supplies the heat required during the subsequent operations of adding a saponifiable oil, an alkaline solution, and an anti-emulsion agent, which other steps are carried on as hereinbefore described.

Having now fully described my invention, what I claim and desire to protect by Letters Patent is:

1. The process of purifying oil, such as crank case lubricating oil, by removing therefrom impurities, such as carbon, which comprises adding to the dirty oil a saponifiable oil which is miscible with the oil to be purified, then adding an alkali adapted to saponify the saponifiable oil and form a counter colloid to take up the suspended colloidal carbon, and separating the lubricating oil from the other and heavier constituents.

2. The process of purifying oil, such as crank case lubricating oil, by removing therefrom impurities, such as carbon, which comprises adding to the dirty oil a saponifiable oil which is miscible with the oil to be purified, then adding an alkali adapted to saponify the saponifiable oil and form a counter colloid to take up the suspended colloidal carbon, adding an anti-emulsifying agent, and separating the lubricating oil from the other and heavier constituents.

3. The process of purifying oil, such as crank case lubricating oil, by removing therefrom impurities, such as carbon, which comprises adding to the dirty oil oleic acid, then adding an alkali adapted to saponify the oleic acid and form a counter colloid to take up the suspended colloidal carbon, and separating the lubricating oil from the other and heavier constituents.

4. The process of removing carbon and gasoline from used oil, such as crank case lubricating oil, which comprises first driving off the gasoline, then adding a saponifiable oil which is miscible with the oil to be purified, then adding an alkali to saponify the saponifiable oil and form a counter colloid to take up the suspended colloidal carbon, and then separating the lubricating oil from the other and heavier constituents.

5. The process of removing carbon and dirt from used oil, such as crank case lubricating oil, which comprises adding a saponifiable oil which is miscible with the oil to be purified, then adding an alkali to saponify the saponifiable oil and form a counter colloid to take up the suspended colloidal carbon, and applying centrifugal force to separate from the lubricating oil the soap, dirt and carbon. 10

In testimony of which invention, I have hereunto set my hand, at Philadelphia, Penna., on this 21st day of April, 1919.

CYRUS HOWARD HAPGOOD.