UNITED STATES PATENT OFFICE.

JAMES O. HANDY, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR TO PITTSBURGH TESTING LABORATORY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

PROCESS OF TREATING USED LUBRICANTS.

1,281,354. Specification of Letters Patent. Patented Oct. 15, 1918.

No Drawing. Application filed May 23, 1917. Serial No. 170,572.

To all whom it may concern:

Be it known that I, JAMES O. HANDY, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in the Processes of Treating Used Lubricants, of which the following is a full, clear, and exact description.

My invention is designed to provide a cheap, simple and effective process by which used lubricants, such, for example, as those used in lubricating explosive engines, may be regenerated.

These used oils or lubricants usually contain tarry or asphaltic material produced by oxidation during service, and usually unsaturated hydrocarbons formed by exposure to heat and air.

In carrying out my process, in its preferred form, I first dissolve the used oil, previously clarified to some extent by settling or by centrifuging, in a hydrocarbon solvent, such as petrolic naphtha or gasolene. The solvent is preferably in large volume proportionate to the amount of oil, for example, four times as much gasolene as used oil. This mixture is then preferably shaken with bone-black, fullers' earth, or similar material, the latter being preferably about one-eighth of the mixture by weight. The sediment or solid impurities contained are then removed by filtering, or equivalent action. Filtering is preferable on account of its cheapness, and this treatment removes the tarry or asphaltic materials, including any coloring matters, the particles of bone-black or clay exerting an attraction thereon, known as adsorption. The remaining solution is next treated with a two per cent. solution of caustic soda (sodium hydroxid) to neutralize the acid bodies. The caustic soda is then separated and the oil solution washed with water and then treated with concentrated sulfuric acid. The amount of acid used is preferably about two per cent. of the original weight of oil used. This acid is then allowed to separate and the oil solution is next treated with a caustic soda solution to neutralize any traces of acid, and is finally cleaned by washing with water. The gasolene or other solvent is then distilled off, leaving the oil or lubricant of practically the same viscosity or body as the original oil and of a satisfactory color.

The dissolving of the oil or lubricant in hydrocarbon solvent is important since thereby the chemicals used are prevented from acting so violently as to destroy or affect the quality of the oil. By thus treating the dissolved oil or lubricant with the chemicals, the recovered oil is substantially equal in quality to the original oil, and the amount lost by the refining treatment does not usually exceed ten per cent.

The advantages of my invention will be obvious to those skilled in the art, since a comparatively cheap, simple and effective method is provided for recovering waste lubricants and restoring them.

The bleaching or decolorizing, which is preferably carried out by shaking with bone-black, fullers' earth, or similar material, and then filtering, may be carried out as the final step of the process; and in my claims, which include this bleaching or decolorizing, I do not consider myself limited to the steps in the specific order recited, as the decolorizing may be carried out either as above described or as a final step.

Other acids may be used instead of concentrated sulfuric acid, other caustic alkalies or alkaline earth may be used instead of caustic soda, the sequence of the steps may be changed and variations may be made in the solvents and the steps involved, without departing from my invention as defined in the broader claims.

I claim:

1. In the method of treating used lubricants, the steps consisting of clarifying the used lubricant, dissolving it in a hydrocarbon solvent, decolorizing the solution by adsorption, treating the solution with acid, and removing the solvent, substantially as described.

2. The method of treating used lubricants, consisting in dissolving the lubricant in a hydrocarbon solvent, treating the solution with acid, allowing the acid to separate, neutralizing the solution, and removing the solvent; substantially as described.

3. The method of treating used lubricants, consisting in dissolving the lubricant in hy-

drocarbon solvent, removing the solid suspended matters and partially bleaching the solution, treating with alkali, then treating with an acid, allowing the acid to separate, neutralizing any remaining acid in the solution, and then removing the solvent; substantially as described.

4. The method of treating used lubricants, consisting in dissolving the lubricant in a hydrocarbon solvent, removing the solid or suspended matters and decolorizing the solution, treating with an alkali, then treating with an acid, allowing the acid to separate, and neutralizing, washing and distilling off the solvent; substantally as described.

5. In the method of treating used lubricants, the steps consisting of clarifying the used lubricant, dissolving it in a hydrocarbon solvent, decolorizing the solution by adsorption, treating with an alkali, and treating the solution with acid, substantially as described.

In testimony whereof, I have hereunto set my hand.

JAMES O. HANDY.