Patented Sept. 20, 1927. 1,643,272

UNITED STATES PATENT OFFICE.

THEODOR HELLTHALER, OF GRANSCHUTZ, GERMANY, ASSIGNOR TO THE FIRM: HUGO STINNES RIEBECK MONTAN UND ÖLIVERKE AKT. GES., OF HALLE-ON-THE-SAALE, GERMANY.

PROCESS OF REFINING MINERAL OILS.

No Drawing. Application filed August 1, 1925, Serial No. 47,607, and in Germany January 28, 1925.

This invention relates to the process of refining mineral oils of every description. This process was hitherto generally carried out by treating the oils with sulphuric acid whereby the basic substances and such which cause the formation of resins and asphalt are removed, but at the same time a number of undesired secondary reactions take place, which for a long time have been the object of particular investigations. For instance, it is well known, that, besides acid resins, numerous oxidation products and sulfo compounds are formed, which, owing to their generally rather viscous consistency, contain considerable quantities of refined products. Furthermore by the subsequent inevitable washing process the oils are emulsified, thereby causing the loss of considerable quantities of oil.

Many experiments have been made to substitute other chemical agents for sulphuric acid. Thus among other substances anhydrous tin tetrachloride has been proposed as a refining agent. However on subjecting mineral oils to the action of this product under the conditions described in the literature a more or less violent reaction with the production of heat is observed which depends upon the quantity of the unsaturated compounds present. Each added drop is at once enclosed in a dark, spongy resinous mass, whereby the refining agent is prevented from further action upon the mineral oil. Therefore with this method a sufficiently refined and clarified oil can only be obtained when employing considerable quantities of refining agents, and with very great loss of oil.

Now I have found that these disadvantages are avoided by subjecting the mineral oils to the action of titanium tetrahalids, for instance titanium tetrachloride. The weaker action of these substances as compared with tin halids depends, as it seems, upon their greater stability and corresponds to the position of titanium in the periodic system. This greater stability results in a more moderate course of the refining process which is desirable for the most purposes. With titanium tetrahalids, a moderation of the reaction as described in my copending application Ser. No. 47,608 is only necessary when the oils to be refined are unsaturated to a considerable extent and therefore an increased separation of acid resins or asphaltic bodies is to be feared whereby an imperfect utilization and a loss of refining agent would be entailed. In this case, the titanium tetrachloride is to be diluted by an inert substance, such as fuller's earth, silicate of alumina, infusorial earth (kieselghur), clay, activated carbon, soda ash, calcium carbonate and the like. Instead of solid diluents, liquid organic solvents not participating in the reaction may also be employed, such as chlorinated hydrocarbons, petroleum ether, benzin and the like.

Preferably after the action of the titanium halids is completed the oils may be treated with basic bleaching earth which at the same time absorbs the hydrochloric or other acid produced and exerts a bleaching effect on the oils. In this manner I immediately get light-colored oils free from asphalt and having a low tar number.

The improved process forming the object of my present invention may also be used for refining mineral oils of every description, such as petroleum, shale oil, lignite tar primary or low temperature distillation tar or their distillates.

The titanic residue obtained may be easily reconverted by well known processes to the corresponding halids which may be again utilized for refining purposes.

Example.

A dark untransparent residue from paraffin oil, obtained by extracting brown-coal paraffin oil with alcohol, showing

Spec. gravity at 20° C., 0.861; viscosity at 20° C., 2.0° E.; asphalt, 0.4 per cent

was treated for 1 hour at room temperature with a mixture of 2 per cent. of titanium tetrachlorid and 2 per cent of fuller's earth. After filtration the oil was shaken for 1 hour with basic bleaching earth. The refined product had a fine yellow color and showed the following properties:

Spec. gravity at 20° C., 0.858; viscosity at 20° C., 1.8° E.; asphalt, none.

I claim:

1. The process of refining mineral oils which consists in treating the oils at room temperature with titanium tetrahalid diluted by inert substances.

2. The process of refining mineral oils which consists in treating the oils at room

temperature with titanium tetrahalid diluted by solid inert substances.

3. The process of refining mineral oils which consists in treating the oils at room temperature with titanium tetrahalid and thereafter with basic bleaching earth capable of absorbing the acid formed and simultaneously bleaching the oil.

4. The process of refining mineral oils which consists in treating the oils at room temperature with titanium tetrahalid diluted by inert substances and thereafter with basic bleaching earth capable of absorbing the acid formed and simultaneously bleaching the oil.

In testimony whereof I affix my signature.

THEODOR HELLTHALER.

temperature with titanium tetrahalid diluted by solid inert substances.

3. The process of refining mineral oils which consists in treating the oils at room temperature with titanium tetrahalid and thereafter with basic bleaching earth capable of absorbing the acid formed and simultaneously bleaching the oil.

4. The process of refining mineral oils which consists in treating the oils at room temperature with titanium tetrahalid diluted by inert substances and thereafter with basic bleaching earth capable of absorbing the acid formed and simultaneously bleaching the oil.

In testimony whereof I affix my signature.

THEODOR HELLTHALER.

CERTIFICATE OF CORRECTION.

Patent No. 1,643,272. Granted September 20, 1927, to

THEODOR HELLTHALER.

It is hereby certified that the name of the assignee in the above numbered patent was erroneously written and printed as "to the firm: Hugo Stinnes Riebeck Montan und Oliverke Akt. Ges.", whereas said name should have been written and printed as "to the firm: Hugo Stinnes Riebeck Montan und Olwerke Akt. Ges.", as shown by the records of assignments in this office; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 8th day of November, A. D. 1927.

M. J. Moore,
Acting Commissioner of Patents.

Seal

CERTIFICATE OF CORRECTION.

Patent No. 1,643,272. Granted September 20, 1927, to

THEODOR HELLTHALER.

It is hereby certified that the name of the assignee in the above numbered patent was erroneously written and printed as "to the firm: Hugo Stinnes Riebeck Montan und Oliverke Akt. Ges.", whereas said name should have been written and printed as "to the firm: Hugo Stinnes Riebeck Montan und Olwerke Akt. Ges.", as shown by the records of assignments in this office; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 8th day of November, A. D. 1927.

M. J. Moore,
Acting Commissioner of Patents.

Seal