Patented Aug. 21, 1934 1,970,916

UNITED STATES PATENT OFFICE

1,970,916

CORE OIL

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No Drawing. Application May 12, 1930, Serial No. 451,856

23 Claims. (Cl. 22—188)

This invention relates to core compounds and the method of producing them.

In accordance with the present invention, core compounds suitable for use in the forming of cores in foundries have been produced from the acid oil or oily layer separated in the usual refinery practice by heat treatment (for example, with steam) of acid sludges from mineral oils and particularly from paraffin distillates and other light fractions. Two products have been obtained by refining acid oil; one, a liquid compound, and the other, a dry tar compound.

To produce the liquid compound, the lighter constituents of the acid oil, which is preferably neutralized, are removed by heat treatment. The desired core oil may be obtained either as a distillate or residue product, and ordinarily it is preferred that it have an A. P. I. gravity not higher than 25° to 26°.

The preferred practice is to charge a distillation still, of a type well known in the art, three-quarters full of acid oil, previously washed with a solution of caustic soda, and to reduce the acid oil with fire and steam. Two cuts are made. The cut consisting of the distillate from the start to 26° A. P. I. (stream gravity) is not used. The cut from 26° or 25° A. P. I. to 16° A. P. I. constitutes the liquid core oil and has been found satisfactory. It has a high iodine number and viscosity at 100° F. between 150 and 175 sec. Saybolt. A suitable non-mineral drying oil such as menhaden oil, linseed oil, or soy bean oil may be added to the core oil if a very fast drying oil is desired. The ratio of drying oil to acid oil may vary within wide limits, say from 1:5 to 1:1. It is preferably one to three.

After the second cut is made, the bottoms may be further reduced, using air instead of steam, until the oxidized tar bottoms reach a melting point of at least 250° F. and preferably about 265° F., when the tar is withdrawn and cooled. The cold tar is comminuted fine enough to pass a one hundred mesh sieve. The dry tar has a specific gravity of about 1.1 at 65° F., and may be employed in the formation of large cores, as coal tar compounds are now employed. When so used, the resulting cores have great strength and dry rapidly, and are greatly superior in that they do not adhere to the metal and are easily separable from the casting.

A satisfactory liquid core compound has also been secured as a distillate by dry distillation of the acid oil, and condensing and collecting the cut from 26° or 25° A. P. I. stream gravity to the end of the run for use as core oil. Non-mineral oil may be added to this cut if desired, as hereinbefore described.

I may also obtain, in accordance with my invention, core oil as a residue or bottom. In this practice, the acid oil, preferably neutralized, is reduced with fire and steam at a temperature not exceeding 450° F. until the bottoms reach 20° A. P. I. As above set forth, some saponifiable drying oil may be added to the bottoms after they have been withdrawn from the still.

Core oil produced in accordance with the present invention has proven to be satisfactory, both in the core department and the foundry, when employed as in ordinary practice. For example, one volume of oil is mixed with forty-five volumes of sand, more or less, to form the cores. After baking, these cores are strong and durable and do not "blow" or "gas" when in contact with the molten metal.

I claim:

1. A core oil consisting of a mixture of a portion of acid oil having had its lighter constituents removed by heat and having a gravity not exceeding 25° or 26° A. P. I. and a drying oil.

2. A core oil consisting of a mixture of the 26° to 16° A. P. I. distillate cut from acid oil and a drying oil.

3. A core oil consisting of a mixture of reduced acid oil and a non-mineral drying oil in the ratio of three parts of acid oil to one of drying oil.

4. A core oil consisting of a mixture of refined acid oil fraction having an A. P. I. gravity not greater than 25° or 26° and a non-mineral drying oil in the ratio of three parts of acid oil to one of drying oil.

5. The method of manufacturing core oil which consists in subjecting acid oil to distillation and separating the cut from about 26° to 16° A. P. I. stream gravity.

6. The method of manufacturing core oil which consists in subjecting acid oil to distillation, and separating the cut from about 26° to 16° A. P. I. stream gravity and mixing the said cut of distilled acid oil with a drying oil.

7. The method of manufacturing core oil which consists in subjecting neutralized acid oil to heat treatment, separating a cut comprising oil of a stream gravity heavier than 26° A. P. I. and mixing the said cut of refined acid oil with a non-mineral drying oil in the ratio of three parts of acid oil to one of drying oil.

8. The method of manufacturing core oil which consists in reducing acid oil until the residue has an A. P. I. stream gravity of 20°, withdrawing and

cooling said residue, and mixing it with a non-mineral drying oil.

9. A core material comprising sand and a small portion of acid oil free from the lighter constituents thereof.

10. A core material comprising sand and a portion of acid oil having had its lighter constituents removed by heat treatment and having an A. P. I. gravity not higher than 25° or 26°.

11. A core material comprising sand and a small portion of neutralized acid oil having had its lighter constituents removed by heat treatment and having an A. P. I. gravity not exceeding 25° or 26°.

12. A core material comprising sand and a fraction of neutralized acid oil free from the lighter constituents thereof.

13. A core oil prepared from a distillate fraction of neutralized acid oil free from the lighter constituents thereof and comprising the distillate cut from such oil which has an A. P. I. gravity from 26° to 16°.

14. A core material comprising sand and an acid oil reduced with fire and steam until the residue has a gravity of 20° A. P. I. or less.

15. A core material comprising sand and a reduced acid oil residue having had its lighter constituents removed by heat treatment and having a melting point of approximately 265° F.

16. A core material comprising sand and a binding composition comprising high-melt oxidized tar derived from petroleum acid of oil.

17. The method of manufacturing a core material, which comprises mixing about 45 parts of sand with one part of a core oil prepared by subjecting neutralized acid oil to heat treatment and separating the cut comprising oil of a gravity heavier than 26° A. P. I. for use as the core oil, and then baking the mixture of sand and oil.

18. The method of manufacturing a core material, which comprises mixing sand with acid oil residue having had its lighter constituents removed by heat treatment and having a melting point of approximately 265° F., and baking the mixture of sand and oil residue.

19. A core material comprising sand and acid oil distillate of 26° to 16° A. P. I. gravity and a drying oil.

20. A core material comprising sand and a small proportion of oxidized petroleum acid oil tar having a melting point above 250° F.

21. A core material comprising sand and a binding material consisting of an oxidized acid oil residue having a melting point above 250° F. and a specific gravity of about 1.1 at 65° F.

22. An article of manufacture comprising a sand core having a binding agent, said binding agent being a neutralized acid oil, derived from the treatment of a petroleum distillate, having had its lighter constituents removed and having an A. P. I. gravity heavier than 26°.

23. The method of manufacturing a core material which comprises mixing sand with an acid oil residue having had its lighter constituents removed by heat treatment and having a specific gravity of about 1.1 at 65° F., and baking the mixture of sand and oil residue.

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